DOCUMENT RESUME

ED 435 289 HE 032 507

| | |
|---|---|
| AUTHOR | Glazner, Steve, Ed. |
| TITLE | The Strategic Assessment Model. |
| INSTITUTION | APPA: Association of Higher Education Facilities Officers, Alexandria, VA. |
| ISBN | ISBN-1-890956-08-2 |
| PUB DATE | 1999-00-00 |
| NOTE | 130p.; Sponsored in part by Nalco Chemical Co. |
| AVAILABLE FROM | Association of Higher Education Facilities Officers, 1643 Prince St., Alexandria, VA 22314-2818 ($45 members; $65 nonmembers). Tel: 703-684-1446; Fax: 703-549-2772; Web site: <http://www.appa.org>. |
| PUB TYPE | Collected Works - General (020) |
| EDRS PRICE | EDRS Price MF01 Plus Postage. PC Not Available from EDRS. |
| DESCRIPTORS | *Benchmarking; *Educational Facilities; Evaluation Methods; Higher Education; Long Range Planning; Models; School Maintenance; *Strategic Planning |
| IDENTIFIERS | Malcolm Baldrige National Quality Award |

ABSTRACT

This book presents six papers focusing on the application of the strategic assessment model (SAM) to the management of higher education facilities. The papers are part of an ongoing effort by the Association of Higher Education Facilities Officers to provide comparative cost and staffing information and to develop a benchmarking process. The papers explain the origins of SAM, the core competencies related to facilities management, and how these can be affected by SAM. The papers also relate SAM to the Baldrige National Recognition standard and suggest ways of using SAM as a management tool. Following an introduction by Douglas K. Christensen, the individual chapters are: (1) "Understanding the Strategic Assessment Model" (Margaret P. Kinnaman); (2) "Linking the Balanced Scorecard to Your Strategy" (Jack Hug); (3) "APPA's Four Core Competencies" (Gary L. Reynolds); (4) "More Than a Feeling: Deployment of SAM within Baldrige" (Tom Harkenrider); (5) "What Is Benchmarking?" (Mohammad H. Qayoumi); and (6) "Conclusions: Where Do We Go from Here?" (Margaret P. Kinnaman). Appendixes include: "SAM Survey Results" (Laura Long); a list of institutions responding to the SAM survey; the original SAM metrics and definitions; and "The Formal Benchmarking Process" (Mohammad H. Qayoumi). (Contains 62 references.) (DB)

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# THE STRATEGIC ASSESSMENT MODEL

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# The Strategic Assessment Model

***Developed by***

**APPA: The Association of Higher Education Facilities Officers**

**Sponsored in part by Nalco Chemical Co.**

APPA: The Association of Higher Education Facilities Officers, 1643 Prince Street, Alexandria, Virginia 22314-2818

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ISBN: 1-890956-08-2
Printed in the United States of America.

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Editor: Steve Glazner

Editorial production and typography: Wolf Publications, Inc.
Cover design: Naylor Design, Inc.
Printing: TechniGraphix

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# Acknowledgments

The Strategic Assessment Model Consortium met in June 1995 and again in November 1996 to develop SAM, create a survey, and determine future activities. APPA is grateful for the time and energy contributed by the following individuals who participated in one or both of the original consortium meetings: Douglas K. Christensen, William A. Daigneau, Steve Glazner, John P. Harrod Jr., Jack Hug, Henry L. Hutchens, Gary R. Kent, Margaret P. Kinnaman, Wayne E. Leroy, Laura Long, E. Lander Medlin, Kathleen Mulligan, Dave Peirce, Chip Ray, William S. Rose, Roger E. Rowe, Bertram D. Smith Jr., Johnny Torrez, Pieter J. van der Have, and James R. Vespi.

We wish to acknowledge our business partners throughout this process as well. American Management Systems helped us get SAM off the ground during the early stages. Tom Harkenrider of Constructive Concepts, Inc., and Laura Long of LTL Collaborative provided expert survey analysis and guidance. And we are most appreciative of Chip Ray and Nalco Chemical Co. for their contributing sponsorship of this publication.

We also wish to thank the current Strategic Assessment Model Task Force, who met in May 1999 to review the survey results, analyze the SAM performance indicators for appropriateness, and discuss the value and direction of SAM as an important tool for the facilities professional. Current task force members include:

**Margaret P. Kinnaman,** ***Chair***
University of Maryland/Baltimore

**Don Briselden**
Phillips Exeter Academy

**David A. Cain**
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**Douglas K. Christensen**
Brigham Young University

**Tom Harkenrider**
Constructive Concepts, Inc.

**Laura Long**
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**William S. Rose**
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Quinnipiac College

**E. Lander Medlin, Steve Glazner**
APPA

Finally, APPA thanks all the individuals and institutions who participated in the SAM surveys that we have conducted thus far. Your continued support and assistance have been invaluable as we work together to further develop APPA's Strategic Assessment Model.

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# Introduction

Douglas K. Christensen

How do you know how you are doing as a professional in facilities management? What do you measure? Is it *efficiency* alone? How well do you manage the resources available to you? How expensive are your services in their support of your core responsibilities? Do you measure how well you manage things?

*Or* is it a question of *effectiveness*? How well do you satisfy customers/stakeholders in the way that you work with them? How do your stakeholders feel about what you are doing given our core competencies? Do you measure how well you lead and satisfy customers? How do you know that you're being effective?

I am not sure that there is an answer to all of these questions. APPA has attempted through the use of its biennial *Comparative Costs and Staffing Report* to give members a feeling of how they are doing—comparatively. As long as you understand the issues surrounding the report information, along with a correct spin and justification, using the comparative data makes it possible for any member to use this information to establish a reference point of discussion.

In a time when questions are being raised about the efficiency and effectiveness of facilities management, especially within higher education, it becomes imperative that we begin to look at tomorrow. As educational facilities administrators, we need to determine what will happen in our future.

APPA has spent a fair amount of time looking at what role the association can play in the professional lives of its member institutions. Because of our dedication to being a professional partnership with each member, the vision of APPA became Global Partner in Learning. Much time has been spent to realign APPA programs and emphasis to that vision. Almost every aspect of APPA has been revised with the thought of becoming a Global Partner in Learning.

There have been three focus areas incorporated together strategically to meet the vision:

1. Education
2. Research
3. Recognition

A critical component in this effort has been measuring and comparing the results of the higher education workforce with others who provide like services. This opening to the marketplace has caused each of us to look closer at what our outcomes are, given the services being provided. The resulting questions are natural outcomes for the facilities professional: How am I doing, both comparatively and competitively? Are the institutions we serve getting a fair deal? How do we know if they are? If they are not, what can I do?

The three strategic focuses listed above provide a beginning point of analysis. The critical issue of being comparable and being competitive provides a strategic issue. We currently have the makings of an important initiative for our profession.

How do we maintain and improve the facilities profession? APPA has introduced a strategic initiative designed to further maintain and improve the profession. The purpose of APPA's Professional Leadership Center is to enhance and further develop leadership within the educational facilities management professional. The center will provide opportunities for professionals to become further aware of the issues affecting them, and it will teach them the skills they need to handle the resulting changes.

The Professional Leadership Center is divided into three parts:

1. **Leadership Skills Academy.** This is an educational program designed to enhance the leadership skills needed to be successful in today's changing environment; the academy includes three weeks of skill training. The first week, Individual Effectiveness Skills, uses the Covey Leadership training as its basis to improve

the individual skills needed to be an effective leader. The second week, Organizational Skills, focuses on the skills needed to be effective in leading, directing, and changing an organization. And the third week, Professional Skills, focuses on the skills needed to deal with stakeholder issues that have effects on higher education and the facilities profession.

2. **Research Projects.** This section provides opportunities to do research on issues affecting the profession and higher education. Research is critical in dealing with the future. Research results can contribute to the body of knowledge of the profession and allows us to influence our opportunities as well as the solutions to problems.
3. **Recognition.** This part of the center provides an opportunity for professionals who gain skills, do research, and are involved in improving the profession and the education environment. By demonstrating this kind of dedication you would be recognized as an APPA Fellow. The status of Fellow is not a one-time recognition. To be a Fellow you need to be active in the leadership issues of the profession. This status will be recognized as a standard in the profession. Increased awareness to key leaders in education of this professional standing will help to achieve our objectives of being a valuable partner at each institution.

The critical issues of being comparable and being competitive also provides a focus on research. What do we compare? How are we compared to each other? Are there differences? Why? Are we competitive with the market? Are we doing the best for our institutions? To answer these questions will take important and dedicated research. For the past several years an effort has begun to help answer these questions. The Strategic Assessment Model (SAM) was developed by a few APPA professionals who wanted more than comparative information on how to make a judgment on how well we are doing as an industry. There was a need for a tool that could answer the questions of comparative and competitive and answer the questions "How do I improve?" and "How high do I have to reach to get to the next level?"

The purpose of this book is to bring together some of the latest thinking of the next steps beyond the use of the *Comparative Costs and Staffing Report* and before a true benchmarking process can be undertaken. This book will explain where SAM came from and what

makes it important. It will explain our core competencies and discuss how they are affected by the Strategic Assessment Model. The authors will also relate SAM to the Baldrige National Recognition standard and provide ways to use SAM as a valuable management tool.

It is the desire of most professionals to do the *best* job possible. Comparing to others on a fair and equal basis gives the professional an opportunity to look at differences and learn. Comparing improvements within your own institution gives the professional an opportunity to really make a difference. Both are needed to be competitive.

I would like to invite you as you read this book and understand its importance to also find some time and energy to do some research on some of the following topics:

- Another way to measure one of our core competencies
- A process that will give better and more effective results
- A better way to meet the ever-changing needs of the stakeholders.
- Any problem you are having that through study and research now adds value

We can only improve the profession if we work together to that end. I challenge you to become an APPA Fellow and contribute what you can to this life's work. The rewards and satisfaction of seeing your efforts further education and the profession will be everlasting.

Chapter 1

# Understanding the Strategic Assessment Model

Margaret P. Kinnaman

In the current facilities management arena, managers are faced with a sea of ever increasing challenges that include diminishing resources, more sophisticated customer expectations, and a demand for greater accountability. In such a powder keg environment, daydreaming has been known to take over and provide a temporary escape. Many facilities managers fantasize about the good old days when their word was all it took to convince the customer that they were doing a good job. How things have changed!

Many facilities managers today, however, may be feeling that all of their customers are from Missouri, the "show me" state. Their word, as facilities professionals, has been replaced with demands for data, comparisons, and benchmarks. Some of them try to find relief by seeking a quick fix, which, according to Stephen Covey and our own experience, does not exist. Facilities managers must do first things first and take things in some logical order dictated by the laws of nature at their institutions. So what alternatives are available to cope with the realities of the workplace?

APPA has a vision for perhaps just what the doctor ordered. It's not a quick fix but instead a tool that is the result of much research and deliberation. This exciting tool enables facilities managers to track organizational performance along a continuum of key performance indicators, all graphically represented on one page. It also enables managers to compare their organization's performance to that of its peers. In addition, this tool allows managers to establish improvement goals for the year and plot progress toward those goals. Finally, the tool is highly effective in presenting funding requests to deans, presidents, and governing boards. Decision makers can see at a glance the cost of being number one.

Since 1995, APPA has been hard at work with a consortium of facilities professionals to develop their vision into just such a tool that can be used by you to plot your performance, compare your performance to that of your peers, establish organizational improvement goals, and market your performance to your governing boards. This incredible tool is called the Strategic Assessment Model, or SAM for short.

SAM was developed in June 1995 in Arlington, Virginia during three days of intense deliberation between APPA's staff, business partners, and consortium members.

The first question for which we sought an answer was just who might care about the success of this project; basically who are our stakeholders? We found that many people—including Mom and Dad, students, staff, and faculty—all had vested interests in ensuring that the caretakers of the facilities of our colleges, universities, and schools are taking their stewardship role seriously. We then tackled the tough problem of identifying metrics or performance indicators that we're currently using within our organizations.

The consortium's work resulted in the identification of approximately 41 potential benchmarks representing a huge array of numbers and ratios. It quickly became apparent that although many of us are using these benchmarks, few of us are using common definitions and hence comparisons are difficult at best.

After a great deal of discussion, the group agreed that we needed to develop some criteria for the selection of a core group of bench-

marks, basically our "short list." This short list had the potential of being considered as universal indicators used by many organizations. Additionally, we envision in the future the development of a "pick list" of metrics that could lend flexibility and customization to the project and allow an organization to selectively pick those performance indicators that best match the unique needs of the institution. The criteria that we developed for the selection of our short list were are as follows:

- Should apply to 80 percent of the participating population
- Availability of information
- Common definition, ease of understanding
- Effect if not used
- Significant effect
- Universal
- Scalable

The consortium looked at each of the 41 potential indicators, weighed each against the criteria, and came up with a set of 15 core metrics, which were later expanded to 18 (see Figure 1).

The group now had 15 benchmarks, but the question arose about how best to describe them within a structure. American Management System, our business partner at the time, introduced a model that had been developed at Carnegie-Mellon University for software assessment (see Figure 2). The SAM consortium felt that this model presented many strengths, including the ability to show overall organizational performance on one page, plot improvement against a goal, and compare performance with those of our peers. The basic premise of the model is to depict ranges of effectiveness from 1 at the low to 5 at the highest level of both productivity and quality. Because of the model's flexibility, it was adopted for the SAM structure.

To put meat on the bones of SAM, the group then had to identify and define the vertical axis, levels of effectiveness 1 through 5. To do this, the group had to decide which of two range definitions to use. The curve in the first plan was a typical bell-shaped curve with 80 percent of the organizations falling between Levels 2 and 4 and best

- Organizational Strategy
- Plant Renewal Expenditures as a Percentage of Current Replacement Value
- Plant Adaptation Expenditures as a Percentage of Current Replacement Value
- Maintenance Expenditures as a Percentage of Current Replacement Value
- Deferred Maintenance Expendituress as a Percentage of Current Replacement Value
- Annual Facility Operating Expenditures as a Percentage of Gross Institutional Expenditures
- Annual Facility Operating Expenditures Per Gross Square Foot
- Load
- Safety
- Energy Consumption
- Percentage of Work Tasks Covered by Defined Standards
- Training Costs as Percentage of Total Personnel Compensation
- Percent Customer Services for which Customer Satisfaction is Measured on an Annual Basis
- Percent of Stakeholder Groups Measured Annually for Customer Satisfaction
- Continuous Improvement

**Figure 1:** *Fifteen Core Benchmarks*

| Level | Characteristic | Key Challenges | Result |
|---|---|---|---|
| 5 Optimizing | Improvement fed back into process | Still human intensive process<br>Maintain organization at optimizing level | Productivity & Quality |
| 4 Managed | (Quantitative)<br>Measured process | Changing technology<br>Problem analysis<br>Problem prevention | |
| 3 Defined | (Qualitative)<br>Process defined and Institutionalized | Process measurement<br>Process analysis<br>Quantitative quality plans | |
| 2 Repeatable | (Intuitive)<br>Process dependent on Individuals | Training<br>Technical practices<br>--reviews, testing<br>Process focus<br>--standards, process groups | |
| 1 Initial | (Ad hoc/chaotic) | Project management<br>Project planning<br>Configuration management<br>Software quality assurance | Risk |

**Figure 2:** *Breakthrough—Carnegie-Mellon Software Process Assessment Model*



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practices at Level 5. The curve in the second plan is an exponential curve, with 80 percent of organizations falling in Level 1, best practices at Level 4, and stretch goals at Level 5. The group chose this second plan, the exponential model, because it was felt that organizations would use this model to improve performance and because it is open ended with the flexibility of adding a Level 6 as use of the model increases and stretch goals improve (see Figure 3).

From the Carnegie-Mellon model, the group organized its original 15 core indicators under the newly identified column headings and then turned its attentions to the tough stuff. Within a couple of hours, the group had to make a collective best guess at the ranges of levels of performance for each of the 15 indicators. These guesses took into consideration the previously identified definitions of levels of effectiveness: 80 percent of organizations would perform at Level 1, best practices would occur at Level 4, and stretch goals would be at Level 5.

Given this background information, the group started to build the model. The heart of this model is an organization's strategy. The consortium identified one qualitative benchmark, the ranges for which are listed below:

5 Interdependent planning and budget
4 Integrated strategic plan

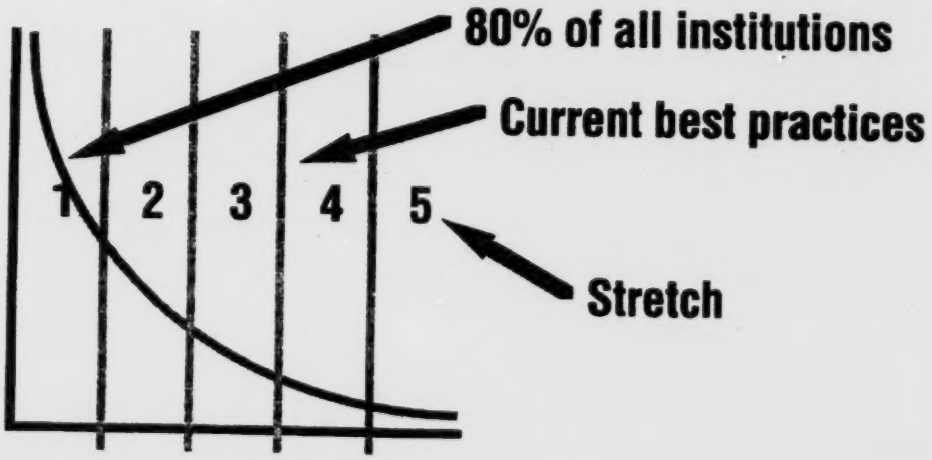


**Figure 3:** *Levels of Effectiveness*

3 Clearly defined goals and objectives
2 Communicated and effective mission
1 Mission statement

Remember, 80 percent of organizations would fall in Level 1, presence of a mission statement.

Next are the seven financial metrics. Most are ratios in which the denominator is the current replacement value of the physical plant. The consortium's best guess of ranges are shown in Figure 4. As an example, for cost per square foot, the range goes from greater than $3.00 a square foot for Level 1 performance to less than $8.00 per square foot for Level 5 performance. Some may make the observation, why would an organization's stretch goals for cost per square foot be $8.00 per square foot versus $3.00 per square foot? Isn't less expensive better? The group discussed this concept at great length and developed the opinion that cost per square foot in the current facilities environment is driven by available funding, and many of the task force members have had to drastically cut levels of service to work within their pool of diminishing resources. The thought process was that the ideal would be a greater cost per square foot, indicating that the organization was funded at a level adequate to offer the full range of services.

| | | | | | | |
|---|---|---|---|---|---|---|
| 5 (Stretch Values) | > 6.5% | > 4% | > 2% | > 15% | 5 - 8% | > $8.00 |
| 4 (Best Practices) | 5 - < 6.5% | 3 - < 4% | 1.5 - < 2% | 12 - < 15% | 10 - > 5% | $6 - $8.00 |
| 3 | 4.5 - < 5% | 2 - < 3% | 1 - < 1.5% | 10 - < 12% | 15 - > 10% | $4 - $5.99 |
| 2 | 4 - < 4.5% | 1 - < 2% | .5 - < 1% | 8 - < 10% | 20 - > 15% | $3 - $3.99 |
| 1 | < 4% | < 1% | < .5% | < 8% | > 20% | < $3.00 |

**Figure 4:** *Financial Perspective*

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For strength of internal processes, three metrics were developed: related to safety, energy, and percentage of tasks performed for which standards are in place. Under innovation and learning, one metric was identified as the ratio of training dollars over total personnel compensation dollars. This ratio measures the relative proportion of the maintenance budget that is reinvested into training. As an example, the group's best guess was that the levels of effectiveness 1 through 5 went from less than 2 percent at Level 1 to greater than 5 percent at Level 5.

Under the last column, customer satisfaction, three metrics were identified. They include percentage of services that are measured, percentage of stakeholders that are surveyed, and use of the results of those surveys for continuous improvement initiatives.

The results of our three days in Arlington was the creation of the Strategic Assessment Model (Figure 5). This tool can be used by educational institutions to plot their organizational performance along a range of key performance indicators. But now the real challenge presented itself: How to get feedback regarding the model and how to raise levels of awareness about its existence.

SAM was introduced to approximately 130 very enthusiastic members at APPA's 1995 Educational Conference in Philadelphia. At that time, volunteers were solicited who would be willing to complete a survey for their organization to provide feedback regarding the appropriateness of the metrics, clarity of definitions, and validation of the levels of effectiveness (basically the task force's best guess) for each of the performance indicators. Approximately 90 people indicated their willingness to participate. Surveys, along with carefully thought-out definitions, were mailed to willing participants in August 1995. By the end of September, approximately 26 organizations had responded, yet even with these few responses the task force was able to make changes to the ranges of a couple of benchmarks (Figure 6). As an example, under the internal processes column heading, specifically the safety benchmark, job injury time was being measured as a percentage of total available hours (excluding paid leave for annual, sick, holiday, and so forth). The group's best guess for Level 1 performance was greater than equal to 25 percent

**STRATEGIC ASSESSMENT MODEL – APPA BENCHMARKING SURVEY**

**Please circle the most appropriate value on the form for each benchmark indicator for your facility.**

***NOTE: All values and ratios are estimated and tentative.***

| Level | Strategy | Financial Perspective | | Internal Processes | | Innovation & Learning | | Customer Satisfaction | |
|---|---|---|---|---|---|---|---|---|---|
| 5 | Independent Planning and Budget | Renewal $/CRV | > 4% | Safety | ≤ 2% | Trng Costs | > 5% | % Services Measured | 100% |
| | | Plant Adaptation $/CRV | > 2% | Energy | ASHRAE | | | % Stakeholder Measured | 100% |
| | | Maintenance $/CRV | > 6.5% | % Task/Stds | > 90% | | | Continuous Improvement | Yes |
| | | Deferred Maintenance $/CRV | 0 - 5% | | | | | | |
| | | Facility $/GSF $ | > 15% | | | | | | |
| | | Cost/Square Foot | > $8.00 | | | | | | |
| | | Lead | all costs, work is reduced | | | | | | |
| 4 | Integrated Strategic Plan | Renewal $/CRV | 3 - < 4% | Safety | 10% | Trng Costs | 5% | % Services Measured | 75% |
| | | Plant Adaptation $/CRV | 1.5 - < 2% | Energy | 3xASHRAE | | | % Stakeholder Measured | 75% |
| | | Maintenance $/CRV | 5 - < 6.5% | % Task/Stds | 80 - 90% | | | Continuous Improvement | Yes |
| | | Deferred Maintenance $/CRV | > 5 - 10% | | | | | | |
| | | Facility $/GSF $ | 12 - < 15% | | | | | | |
| | | Cost/Square Foot | $6.00 - $8.00 | | | | | | |
| | | Lead | all labor & overhead | | | | | | |
| 3 | Clearly Defined Goals and Objectives | Renewal $/CRV | 2 - < 3% | Safety | 15% | Trng Costs | 4% | % Services Measured | 50% |
| | | Plant Adaptation $/CRV | 1 - < 1.5% | Energy | 5xASHRAE | | | % Stakeholder Measured | 50% |
| | | Maintenance $/CRV | 4.5 - < 5% | % Task/Stds | 30 - 69% | | | Continuous Imp'mt | Some |
| | | Deferred Maintenance $/CRV | > 10 - 15% | | | | | | |
| | | Facility $/GSF $ | 10 - < 12% | | | | | | |
| | | Cost/Square Foot | $4.00 - $6.00 | | | | | | |
| | | Lead | labor, fringes, vehicles, small tools, & uniforms | | | | | | |
| 2 | Mission Communicated and Effective | Renewal $/CRV | 1 - < 2% | Safety | 20% | Trng Costs | 3% | % Services Measured | 25% |
| | | Plant Adaptation $/CRV | 0.5 - < 1% | Energy | 6xASHRAE | | | % Stakeholder Measured | 25% |
| | | Maintenance $/CRV | 4 - < 4.5% | % Task/Stds | 10 - 30% | | | Continuous Improvement | No |
| | | Deferred Maintenance $/CRV | > 15 - 20% | | | | | | |
| | | Facility $/GSF $ | 8 - <10% | | | | | | |
| | | Cost/Square Foot | $3.00 - $4.00 | | | | | | |
| | | Lead | labor rate plus fringe benefits | | | | | | |
| 1 | Mission Statement | Renewal $/CRV | < 1% | Safety | ≥ 25% | Trng Costs | 0 - 2% | % Services Measured | 0% |
| | | Plant Adaptation $/CRV | < 0.5% | Energy | > 6 ASHRAE | | | % Stakeholder Measured | 0% |
| | | Maintenance $/CRV | < 4% | % Task/Stds | ≤ 10% | | | Continuous Improvement | No |
| | | Deferred Maintenance $/CRV | > 20% | | | | | | |
| | | Facility $/GSF $ | < 8% | | | | | | |
| | | Cost/Square Foot | < $3.00 | | | | | | |
| | | Lead | basic labor rate | | | | | | |

| Additional Financial Indicators | Additional Process Benchmarks | Additional Innovation & Learning Benchmarks | Additional Customer Satisfaction Benchmarks |
|---|---|---|---|
| | | | |

***Please write in any recommendations for additional benchmark indicators you wish to be considered (optional)***

**Name:** _____

**Institution:** _____

**Figure 5:** *Strategic Asssessment Model Survey*

and Level 5 performance as less than or equal to 2 percent. Feedback from the respondents indicated that the ranges should be greater than or equal to 2 percent for Level 1 and less than or equal to 0.5 percent for Level 5. This change illustrates the importance of the beta test and how important feedback from the testers has been to SAM's development.



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| Level | Strategy | Financial Perspective | | Post-Survey | Internal Processes | | Post-Survey | Innovation & Learning | Post-Survey | Customer Satisfaction | | Post-Survey |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Interdependent Planning and Budget | Renewal $/CRV<br>Plant Adaptation $/CRV<br>Maintenance $/CRV<br>Deferred Maintenance %/CRV<br>Facility $/GIE $<br>Cost/Square foot<br>Load | >4%<br>>2%<br>>6.5%<br>0-5%<br>>15%<br>>$8.00<br>all costs, work hrs reduced | 0-1%<br><br><br><br>>$11<br><$22 | Safety<br>Energy<br>%Task/Stds | ≤2%<br>ASHRAE<br>>90% | ≤5%<br><ASHRAE | Trng Costs >5% | >6% | % Services Measured<br>% Stakeholder Measured<br>Continuous Improvement | 100%<br>100%<br>Yes | >90% |
| 4 | Integrated Strategic Plan | Renewal $/CRV<br>Plant Adaptation $/CRV<br>Maintenance $/CRV<br>Deferred Maintenance %/CRV<br>Facility $/GIE $<br>Cost/Square foot<br>Load | 3-<4%<br>1.5-<2%<br>5-<6.5%<br>>5-10%<br>12-<15%<br>$6.00-$8.00<br>all labor & overhead | >1-3%<br><br><br><br>$8-11<br>$22-24 | Safety<br>Energy<br>%Task/Stds | 10%<br>3x ASHRAE<br>60-90% | .5-1%<br>ASHRAE<br>75-90% | Trng Costs 5% | 6% | % Services Measured<br>% Stakeholder Measured<br>Continuous Improvement | 75%<br>75%<br>Yes | 80-90% |
| 3 | Clearly Defined Goals and Objectives | Renewal $/CRV<br>Plant Adaptation $/CRV<br>Maintenance $/CRV<br>Deferred Maintenance %/CRV<br>Facility $/GIE $<br>Cost/Square foot<br>Load | 2-<3%<br>1-<1.5%<br>4.5-<5%<br>>10-15%<br>10-<12%<br>$4.00-$6.00<br>labor, fringes, vehicles, small tools, & uniforms | >3-5%<br><br><br>$7-9<br>$24-26 | Safety<br>Energy<br>%Task/Stds | 15%<br>5x ASHRAE<br>30-60% | 1-1.5%<br>2x ASHRAE<br>50-75% | Trng Costs 4% | 5% | % Services Measured<br>% Stakeholder Measured<br>Continuous Improvement | 50%<br>50%<br>Some | 40-80% |
| 2 | Mission Communicated and Effective | Renewal $/CRV<br>Plant Adaptation $/CRV<br>Maintenance $/CRV<br>Deferred Maintenance %/CRV<br>Facility $/GIE $<br>Cost/Square foot<br>Load | 1-<2%<br>0.5-<1%<br>4-<4.5%<br>>15-20%<br>8-<10%<br>$3.00-$4.00<br>labor rate plus fringe benefits | >8-10%<br><br><br>$5-7<br>$26-28 | Safety<br>Energy<br>%Task/Stds | 20%<br>6x ASHRAE<br>10-30% | 1.5-2%<br>3x ASHRAE<br>25-50% | Trng Costs 3% | 4% | % Services Measured<br>% Stakeholder Measured<br>Continuous Improvement | 25%<br>25%<br>No | 20-40% |
| 1 | Mission Statement | Renewal $/CRV<br>Plant Adaptation $/CRV<br>Maintenance $/CRV<br>Deferred Maintenance %/CRV<br>Facility $/GIE $<br>Cost/Square foot<br>Load | <1%<br><0.5%<br><4%<br>>20%<br><8%<br><$3.00<br>basic labor rate | >10%<br><br><br><br>$6<br>$29 | Safety<br>Energy<br>%Task/Stds | ≥25%<br>>6ASHRAE<br>≤10% | ≥2%<br>>4xASHRAE<br>≤25% | Trng Costs 0-2% | 3% | % Services Measured<br>% Stakeholder Measured<br>Continuous Improvement | 0%<br>0%<br>No | <20% |

**Figure 6:** *APPA SAM Beta Survey Data*





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Nonetheless, the initial response to the August 1995 survey mailing was disappointing; many facilities organizations were busy with the beginning of the school year and myriad other surveys. Timing of the request was a problem. In addition, some respondents indicated that the information requested was not readily available within the organization. One of the criteria for selection of the "short list" of benchmarks was that the information needed to be easily accessible.

SAM was introduced in greater detail during each of the regional APPA meetings in late 1995. During these regional meetings, attendees were given another opportunity to participate in the beta test by completing a survey by December 1, 1995. The task force wanted to give everyone as much opportunity to participate as possible. What the consortium was trying to achieve was validation on performance indicators, clarification around definitions, and confidence in the accuracy of the ranges of performance for each metric.

So where have we come with SAM in the meantime? During each APPA annual meeting, SAM's progress has been reviewed with enthusiastic audiences. In addition, those few brave souls who have applied SAM to their working environment have shared their experiences with the membership. These include Miami University of Ohio, the University of Massachusetts/Amherst, and the University of North Texas, among others.

In 1997, SAM was again rolled out to the membership as an add-on to the Comparative Costs and Staffing project. Approximately 100 organizations responded, and in January 1999 an in-depth report was sent to each respondent giving a summary of their performance in comparison to others within their regions and within their Carnegie classifications (see Appendix A). In addition, respondents were given a disk containing all reports for use within their operations.

So four years and two surveys later, SAM has been transformed as a result of member feedback and participation. Several performance indicators have been added and levels of effectiveness adjusted (Figure 7). Although much progress has been made, SAM as an APPA research initiative is far from being completed. There is still much to be learned as we walk down this assessment pathway in the search for excellence in the facilities management profession.

**APPA Strategic Assessment Model (SAM)** — **1995/96 Fiscal Year**

| Levels of Organizational Effectiveness | Financial Perspective | | Internal Process | | Innovation And Learning | | Customer Satisfaction | |
|---|---|---|---|---|---|---|---|---|
| 5 (Stretch Goals) | Facility Operating $/CRV | => 5.5% | Strategy | Level 5 | Trng $ Invested | =>3.0% | % Svcs Measured | 95% - 100% |
| | Plant Renewal $/CRV | => 4.0% | PM Backlog | | Trng Hrs Invested | =>3.0% | % Stakeholder Measured | 95% - 100% |
| | Plant Adaptation $/CRV | => 3.0% | Safety | =<0.4% | Training Mandated | =<0.03% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | =< 0.25% | Attendance | =<1.5% | CQI | Level 5 | | |
| | Def. Maint. Expend. $/CRV | => 3.0% | Energy Consumption | =<25,000 | | | | |
| | Facility Operating $/GIE | =>12.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 4 (Current Best Practice) | Facility Operating $/CRV | 5.0% - <5.5% | Strategy | Level 4 | Trng $ Invested | 2.6% - <3.0% | % Svcs Measured | 90% - <95% |
| | Plant Renewal $/CRV | 3.0% - <4.0% | PM Backlog | | Trng Hrs Invested | 2.0% - <3.0% | % Stakeholder Measured | 90% - <95% |
| | Plant Adaptation $/CRV | 2.0% - <3.0% | Safety | 0.6% - >4.0% | Training Mandated | 0.04% - >0.03% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | 0.85% - >0.25% | Attendance | 2.2% - >1.5% | CQI | Level 4 | | |
| | Def. Maint. Expend. $/CRV | 2.25% - <3.0% | Energy Consumption | 50,000 - >25,000 | | | | |
| | Facility Operating $/GIE | 11.5% - <12.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 3 | Facility Operating $/CRV | 4.5% - <5.0% | Strategy | Level 3 | Trng $ Invested | 2.2% - <2.6% | % Svcs Measured | 85% - <90% |
| | Plant Renewal $/CRV | 2.0% - <3.0% | PM Backlog | | Trng Hrs Invested | 1.5% - <2.0% | % Stakeholder Measured | 85% - <90% |
| | Plant Adaptation $/CRV | 1.0% - <2.0% | Safety | 0.8% - >0.6% | Training Mandated | 0.05% - >0.04% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | 1.15% - >0.85% | Attendance | 2.4% - >2.2% | CQI | Level 3 | | |
| | Def. Maint. Expend. $/CRV | 1.5% - <2.25% | Energy Consumption | 65,000 - >50,000 | | | | |
| | Facility Operating $/GIE | 10.5% - <11.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 2 | Facility Operating $/CRV | 4.0% - <4.5% | Strategy | Level 2 | Trng $ Invested | 1.8% - <2.2% | % Svcs Measured | 80% - <85% |
| | Plant Renewal $/CRV | 1.25% - <2.0% | PM Backlog | | Trng Hrs Invested | 1.3% - <1.5% | % Stakeholder Measured | 75% - <85% |
| | Plant Adaptation $/CRV | 0.7% - <1.0% | Safety | 0.1% - >0.8% | Training Mandated | 0.07% - >0.05% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | 1.95% - >1.15% | Attendance | 2.6% - >2.4% | CQI | Level 2 | | |
| | Def. Maint. Expend. $/CRV | 0.75% - <1.5% | Energy Consumption | 80,000 - >65,000 | | | | |
| | Facility Operating $/GIE | 9.5% - <10.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 1 (80% of Orgs are Performing at This level) | Facility Operating $/CRV | <4.0% | Strategy | Level 1 | Trng $ Invested | <1.8% | % Svcs Measured | <80% |
| | Plant Renewal $/CRV | <1.25% | PM Backlog | | Trng Hrs Invested | <1.3% | % Stakeholder Measured | <75% |
| | Plant Adaptation $/CRV | <0.7% | Safety | >0.10% | Training Mandated | >0.07% | Employee Satisfaction | No |
| | Def. Maint. Backlog $/CRV | >1.95% | Attendance | >2.6% | CQI | Level 1 | | |
| | Def. Maint. Expend. $/CRV | <0.75% | Energy Consumption | >80,000 | | | | |
| | Facility Operating $/GIE | <9.5% | | | | | | |
| | Recharge for Services | No | | | | | | |

Figure 7: *The SAM Matrix*





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Chapter 2

# Linking the Balanced Scorecard to Your Strategy

Jack Hug

The profession of facilities management is complex and challenging. The diversity of activities requires a management system that is versatile and adaptable across the entire scope of activity. The balanced scorecard is a relevant and meaningful management framework for facilities professionals.

Although APPA first introduced the balanced scorecard format in the framing of its Strategic Assessment Model (SAM) for benchmarking performance, the scorecard is much more than just a measurement system. The balanced scorecard is a comprehensive management system that allows an organization to effectively change the way it manages and measures performance. A unique feature of the balanced scorecard is its utility in linking the facility management organization's strategies with activities that drive desired results.

This chapter uses examples to show the process of building the balanced scorecard for a college or university facilities management organization by incorporating the concepts and metrics contained in the APPA/SAM project.

## Background

Many of the management concepts that have supported the rise of the facilities management profession to preeminence among worldwide campus facilities officers are no longer suited to current demands nor to what is expected to meet future needs. Facilities management services by necessity are now required to be cost effective, customer focused, streamlined and adaptable, easy for workers to deliver, and easy for customers to obtain. Campus facilities services must be innovative and demonstrate accountability. Services must be delivered consistently with a high degree of efficiency and quality. In essence, the challenge that the facilities manager and the facilities department workforce face lies in the very nature of what has to be done:

- Keep everything running and operating smoothly, all the time
- Satisfy every customer's need, at the lowest possible cost
- Keep every stakeholder informed
- Continuously change and improve everything

The blueprint for the future for facilities service departments has already been drawn. Those organizations that excel at and sustain a level of service excellence will survive well into the 21st century. Those that do not will simply disappear.

A glance at the current business environment (Figure 8) helps capture the seriousness of this challenge.

The average American institution today is facing the three Cs:

- Overwhelming *c*omplexity
- Increasing *c*ompetition
- Tumultuous accelerated *c*hange (Archer, 1998)

## APPA/SAM—A New Performance Architecture

APPA has recognized that a new performance architecture is necessary if facilities managers are going to successfully meet these new requirements and sustain high levels of performance over time. The old adage "one rose don't make a summer" is as true today as it was

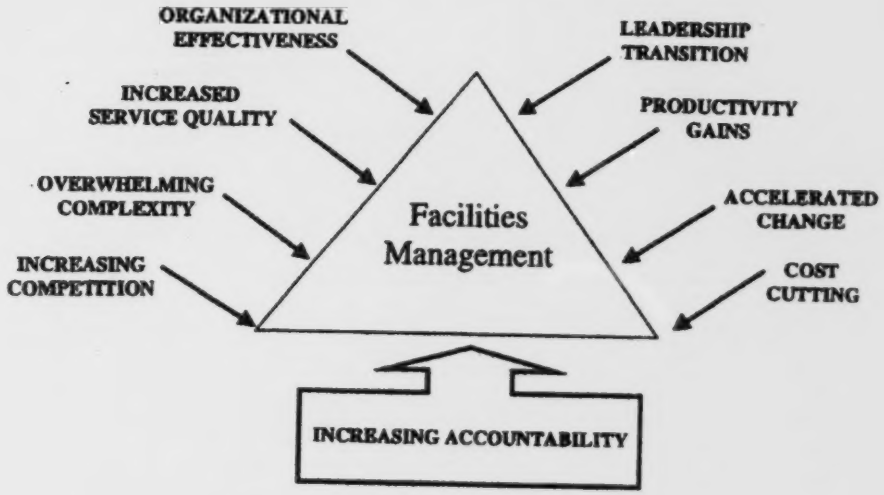


**Figure 8:** *Service Environment*

when it was first coined (Richard, 1966). "The world does not stand still, and performance requirements keep ratcheting up over time" (Source Management, 1997, p. 31). It is essential that facility managers find a way to develop the skills and competencies to do the following:

- Focus on the future and articulate the organizational vision
- Set goals and performance objectives
- Track progress over time through a meaningful set of performance measures

## The Balanced Scorecard Concept

Today's educational facilities managers realize the effect that measurements have on organizational performance. However, they rarely think of measurement as an essential part of their strategy for operating and maintaining the institution's physical plant. The balanced scorecard provides a comprehensive framework that can be used to meet a number of management and leadership requirements.

At many higher education institutions, the budget has traditionally served as the department dominate and sole performance measure. Historical budget performance for a facilities department often

served as a baseline for departmental planning. This baseline was generally projected into the future. Outstanding performance was identified with "staying within budget" (i.e., spending no more and no less than the allocated budget). The financial measures were "lagging" measures. They told managers more about the past long after the decision was made than they did about how well the organization's current practices and policies were working. Furthermore, they gave no clue as to their effect on future performance of the organization.

Currently, financial measures, as a sole source measure of organizational performance, are totally inadequate. Much more is needed to successfully guide and evaluate a pathway that the facilities management organizations must take to create an acceptable future. The balanced scorecard has a proactive quality that links operational objectives (leading measures) to financial objectives (Kaplan and Norton, 1996). Therefore, the four perspectives of the balanced scorecard complement the financial measures of past performance with operational measures that are the true drivers of future performance.

The authors of the balanced scorecard, Robert S. Kaplan and David P. Norton, argue that senior managers need this balanced approach (Figure 9). Financial measures alone cannot motivate, pre-

Financial Perspective
How do we look to our stakeholders?
Customer Perspective
How do customers see us?
Strategy
Internal Process Perspective
What must we excel at?
Innovation & Learning Perspective
Can we continue to improve and create value?
Source: Kaplan, Robert S. and David P. Norton
The Balanced Scorecard, Measures that Drive Performance
Harvard Business Review, Jan-Feb 1992

**Figure 9:** *A Balanced Scorecard. A "balanced scorecard" approach measures performance from several distinct perspectives.*



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dict, or create future performance. With the scorecard, an organization can measure performance from four different perspectives of equal importance:

1. Financial perspectives
2. Customer satisfaction
3. Internal processes
4. Innovation and learning

## Creating an Acceptable Future

In building the balanced scorecard, the vision, mission, principles, and values of the facilities management organization are the visible center or the "jumping-off point." The balanced scorecard management system requires a combination of communicating, informing, and learning throughout the organization. Translating the vision, communicating and linking the organization's operating plans, and a healthy dose of feedback and learning are required. The link between these elements from senior managers to frontline service providers is crucial. The balanced scorecard can be a powerful vehicle to accomplish this critical leadership task. Clarity of organizational purpose and linkage of this purpose to the individual employee's job objective is key for sustaining organizational success and organizational longevity.

Translating the vision helps managers build a consensus around the department's strategy and expresses it in terms that guide action. Communicating and linking the department's operating plans lets managers articulate their strategy throughout the organization and to link this strategy to division and individual goals.

Feedback and learning give organizations the capacity for strategic learning, for meaningful dialogue, and for testing scenarios on which strategy can be based. It allows decision making that takes into consideration any necessary adjustments.

The use of the balanced scorecard allows management to stay focused and on course. Creating the future requires leaders to show focus and consistency.

## Building the Balanced Scorecard

The organization's shared vision and mission are the starting point for building a balanced scorecard (Kaplan and Norton, 1996). Building a balanced scorecard is a process of translating an organization's vision and mission into strategic objectives, concrete and meaningful performance measures, and then setting specific performance targets (Figure 10). The process itself can help to bring clarity and focus to the organization.

As an organization starts to build the scorecard, it will gain further insights about the scorecard itself. Initially there may be measures that do not work, some that may need to be modified, and new measures that the organization may want to incorporate into the scorecard.

The following examples of strategic objectives are intentionally general in nature. They will help to demonstrate how the APPA/

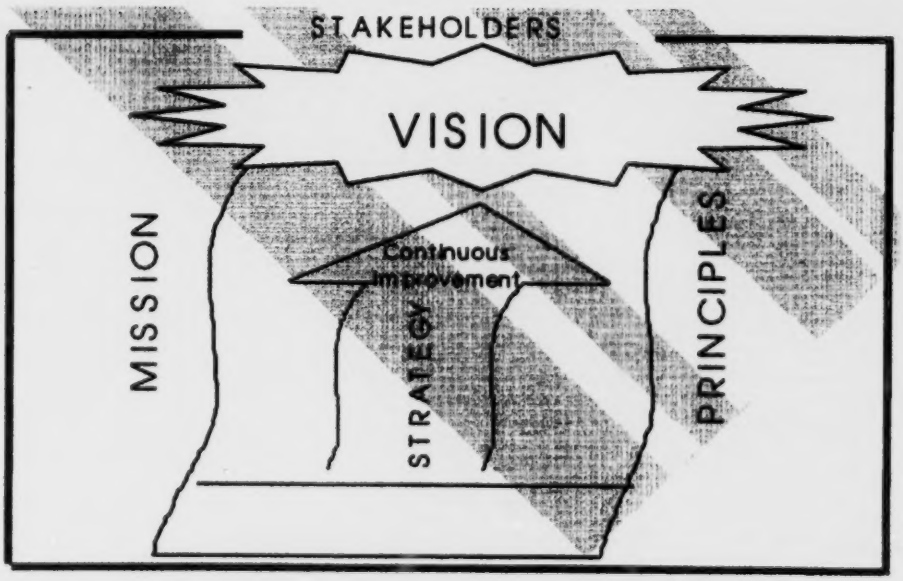


**Figure 10:** *Linking Strategic Direction with Daily Activities to Drive Results. A vision describes the ultimate goal. A strategy is a shared understanding about how the goal is to be reached.*

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SAM measures link to strategic objectives. It is important to incorporate measures that are specifically derived from the organization's strategy. These examples show how the objectives and measures in each of the four perspectives of the balanced scorecard interrelate the strategic themes.

### Vision/Mission

Assume a hypothetical vision ("Building the world's best university in collaboration with our academic partners") and a hypothetical mission ("Excellence in service to the campus and the community").

### Strategic Themes

The strategic themes derived from the department planning process for each of the four perspectives are shown in Figure 11.

From each of these strategic themes, strategic goals and performance measurements can be developed.

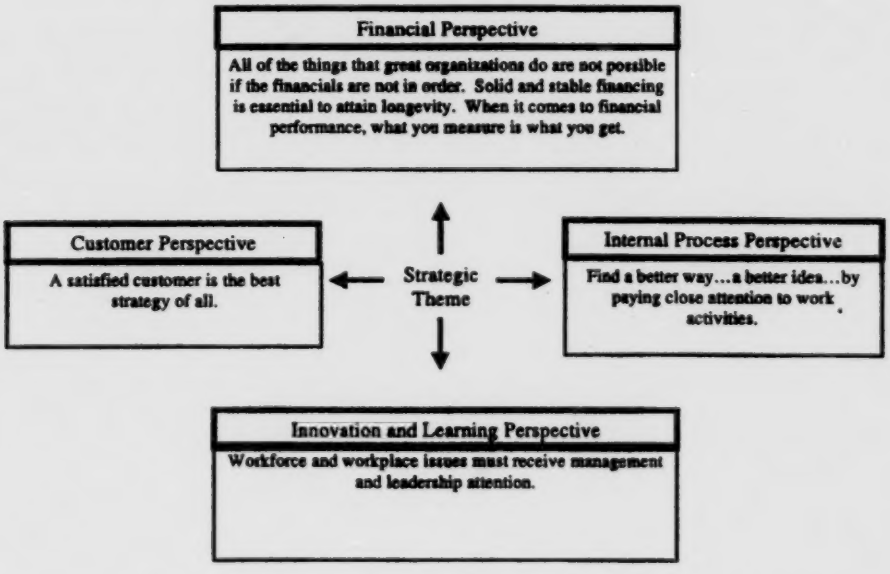
Financial Perspective
All of the things that great organizations do are not possible if the financials are not in order. Solid and stable financing is essential to attain longevity. When it comes to financial performance, what you measure is what you get.
Customer Perspective
A satisfied customer is the best strategy of all.
Strategic Theme
Internal Process Perspective
Find a better way...a better idea...by paying close attention to work activities.
Innovation and Learning Perspective
Workforce and workplace issues must receive management and leadership attention.

**Figure 11:** *Strategic Themes. The balanced scorecard provides a framework to translate the vision into a clear set of objectives and strategic goals.*



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## Strategic Goals and Measurements

### *Financial Perspective: "How Do Our Stakeholders See Us?"*

The financial objectives play a dual role: They define the financial performance expected and they serve as the ultimate target for the other three perspectives (Figures 12 and 13).

### *Customer Perspective: "How Do Customers See Us?"*

If service organizations are to achieve long-run success, they must create and deliver services that are valued by customers. Beyond aspiring to satisfy customers, facilities managers must in this customer perspective segment of the balanced scorecard translate their mission and strategy statements into specific customer-based objectives (Figure 14).

### *Internal Process Perspective: "At What Must We Excel?"*

The facilities manager must identify the service processes that are the most critical for achieving customer and stakeholder objectives (Figure 15). The University of California facilities managers, through their teamwork in the Partnership for Performance initiative, have identified the following service processes as most critical:

- Emergency work
- Building maintenance (routine work orders)
- Preventive maintenance
- Utility services
- Grounds
- Custodial
- Recharge services

### *Innovation and Learning Perspective: "Can We Continue to Improve and Create Value?"*

The objectives established in the financial, customer, and internal process perspectives identify where the organization must excel to achieve breakthrough performance. The objectives in the innovation and learning perspective (Figure 16) are the drivers for achieving excellent outcomes in the first three perspectives.

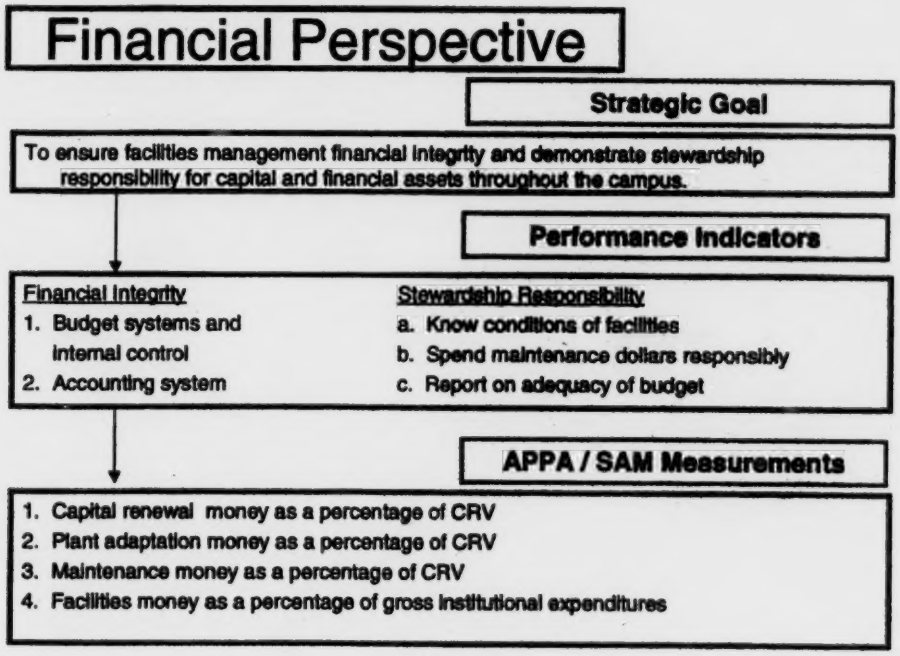
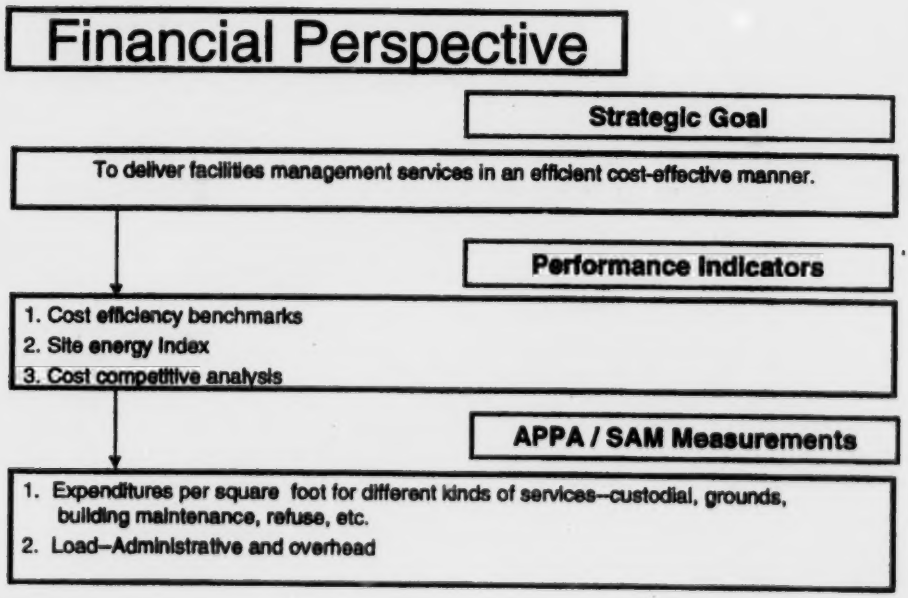

Financial Perspective
Strategic Goal
To ensure facilities management financial integrity and demonstrate stewardship responsibility for capital and financial assets throughout the campus.
Performance Indicators
Financial Integrity
1. Budget systems and internal control
2. Accounting system
Stewardship Responsibility
a. Know conditions of facilities
b. Spend maintenance dollars responsibly
c. Report on adequacy of budget
APPA / SAM Measurements
1. Capital renewal money as a percentage of CRV
2. Plant adaptation money as a percentage of CRV
3. Maintenance money as a percentage of CRV
4. Facilities money as a percentage of gross institutional expenditures

**Figure 12 above and Figure 13 below:** *The strategic goals are translated into a system of performance measurements that communicate the facilities managment organization's focus.*


Financial Perspective
Strategic Goal
To deliver facilities management services in an efficient cost-effective manner.
Performance Indicators
1. Cost efficiency benchmarks
2. Site energy index
3. Cost competitive analysis
APPA / SAM Measurements
1. Expenditures per square foot for different kinds of services--custodial, grounds, building maintenance, refuse, etc.
2. Load--Administrative and overhead

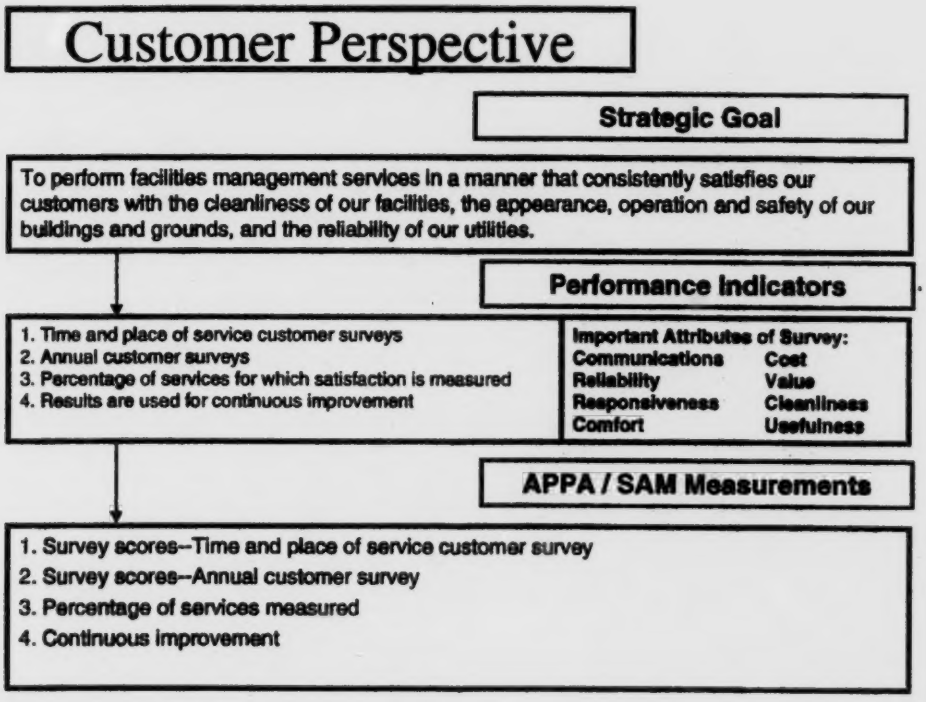

Customer Perspective
Strategic Goal
To perform facilities management services in a manner that consistently satisfies our customers with the cleanliness of our facilities, the appearance, operation and safety of our buildings and grounds, and the reliability of our utilities.
Performance Indicators
1. Time and place of service customer surveys
2. Annual customer surveys
3. Percentage of services for which satisfaction is measured
4. Results are used for continuous improvement
Important Attributes of Survey:
Communications
Reliability
Responsiveness
Comfort
Cost
Value
Cleanliness
Usefulness
APPA / SAM Measurements
1. Survey scores--Time and place of service customer survey
2. Survey scores--Annual customer survey
3. Percentage of services measured
4. Continuous improvement

**Figure 14:** *The Customer Perspective*

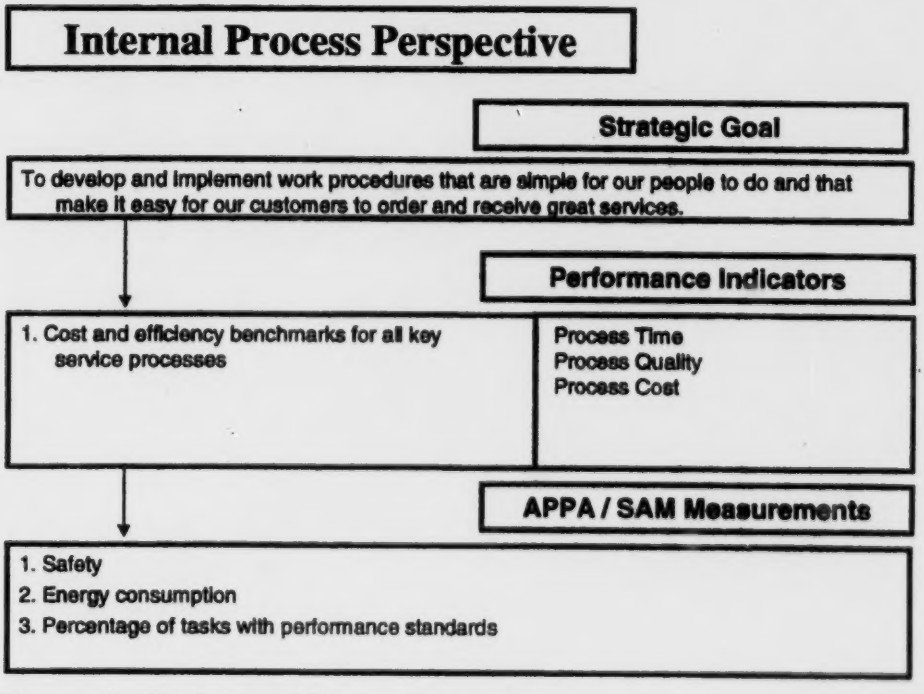

Internal Process Perspective
Strategic Goal
To develop and implement work procedures that are simple for our people to do and that make it easy for our customers to order and receive great services.
Performance Indicators
1. Cost and efficiency benchmarks for all key service processes
Process Time
Process Quality
Process Cost
APPA / SAM Measurements
1. Safety
2. Energy consumption
3. Percentage of tasks with performance standards

**Figure 15:** *The Internal Process Perspective*



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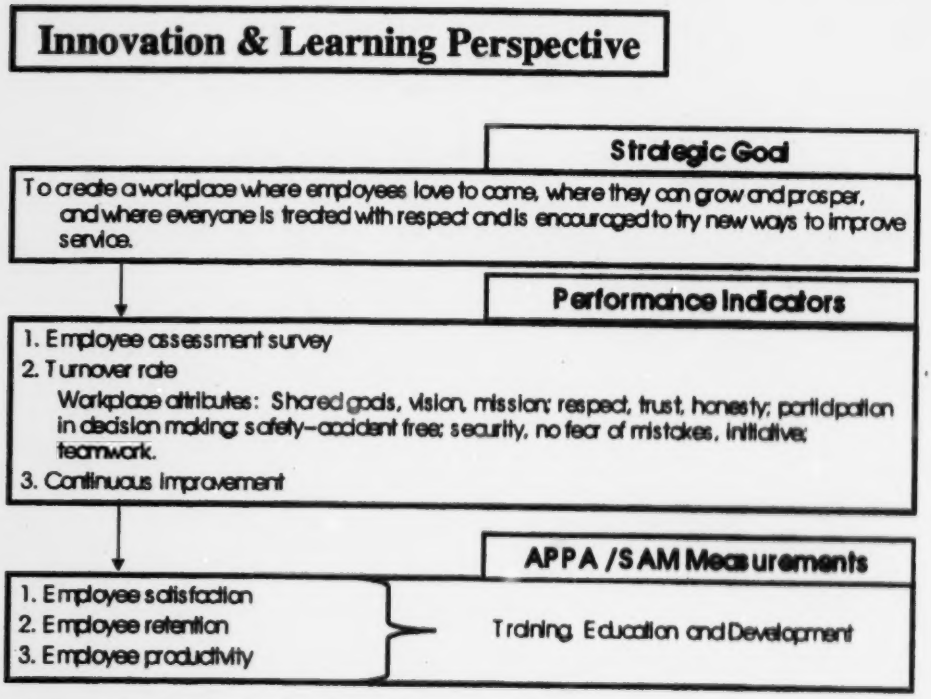
Innovation & Learning Perspective
Strategic Goal
To create a workplace where employees love to come, where they can grow and prosper, and where everyone is treated with respect and is encouraged to try new ways to improve service.
Performance Indicators
1. Employee assessment survey
2. Turnover rate
Workplace attributes: Shared goals, vision, mission; respect, trust, honesty; participation in decision making; safety–accident free; security, no fear of mistakes, initiative; teamwork.
3. Continuous improvement
APPA /SAM Measurements
1. Employee satisfaction
2. Employee retention
3. Employee productivity
Training, Education and Development

**Figure 16:** *The Innovation and Learning Perspective*

Managers must pay attention to these workforce and workplace issues. After all, it is these systems that drive long run economic performance. In addition to the training measurement contained in APPA/SAM, there are three principal measurement categories that complement this perspective:

1. Employee capability
2. Information systems capability
3. Motivation, empowerment, and alignment

## Conclusion

### The Missing Measurement Program

Measurement is a critical component of any facilities management organization. Most managers recognize its vital role in communicating, rewarding, and tracking the organization's achievements. Because many of the facilities management measures have traditionally been financial in nature, they are in most cases "lagging" measures; telling

more about past performance while failing to provide information about the organization's potential and likely future performance. The balanced scorecard requires management to examine some new thinking about how the facilities management organization manages and measures performance.

The balanced scorecard helps the facilities manager see the value of a focused set of performance measurements. However, Kaplan and Norton constantly emphasize throughout their writings that an effective balanced scorecard is more than a limited list of measures gathered into four categories. "A properly constructed scorecard should tell the story of the business unit's strategy through such a sequence of cause-and-effect relationship" (Kaplan & Norton, 1996, p. 149).

Facilities managers who have adopted the balanced scorecard have discovered that its use enables them to bridge a gap that formerly existed in their organization; a fundamental disconnect between management's idea of strategy and the workforce idea of implementation. Although one of the principal benefits of the balanced scorecard is helping management translate strategy into performance measures and targets, the scorecard can be used for a variety of reasons:

- It helps focus the entire organization on what must be done to create breakthrough performance.
- It can act as an integrating device, an umbrella, for a variety of diverse, often disconnected programs, such as total quality management, reengineering, process redesign, and customer service.
- High-level management measures can be broken down to lower levels in the organization so that supervisors and employees can see what they must do well to improve organizational effectiveness.
- It provides a comprehensive view that overturns the traditional idea of the organization as a collection of isolated, independent functions and departments (*Measuring Corporate Performance*, 1993).

For facilities managers, operational strategy is once again the single most important issue on the profession's agenda. In the 1990s, outsourcing of facilities services, driven mostly by financial rationale and promises of leveraging resources that the institution did not have, proved in many cases to be elusive. Campus services that

were outsourced primarily for financial reasons are now facing a new rationale: how to make the service better, add value, and regularly bring forth knowledge-based solutions. Strategy, therefore, has taken on new meaning and the facilities manager must reexamine how services are provided if the organization is going to succeed.

The balanced scorecard compels the organization to find the previously unidentified knowledge in the facilities management organization, to tap into it, and to bring it to bear successfully on solutions to service requirements. The hidden assets and untapped knowledge that can be uncovered is only one example of a "bonus" derived from using the balanced scorecard.

Since its initial publication in January 1992, the concept of the balanced scorecard has been interpreted in many different ways. Some people have chosen to view the balanced scorecard simply as a focused set of financial and nonfinancial measures. Renaissance Solutions (1996/97), an organization that has worked with many organizations in designing scorecards, cautions on the dangers of such a simplistic interpretation. In execution, the measurement system may not reflect the strategy of the organization. Building a balanced scorecard may seem simple, but it is deceptively challenging. The successful design of a balanced scorecard should not be underestimated.

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Chapter 3

# APPA's Four Core Competencies

Gary L. Reynolds

Facilities management in higher education is a broad profession that requires many skills to oversee the diverse activities that are required to support the educational mission. In many cases, these diverse activities are closely related and require leadership and management skills that are complementary and self-reinforcing. However, quite often these activities bear no relation to one another and thus require an entirely different skill set. Not only must the facilities manager have the technical skills and knowledge of these many activities, he or she must also manage the resources and processes that support these activities. These supporting resources and processes then require an additional commitment of oversight from the facilities manager to ensure that they are effective.

A facilities manager quite often is responsible for the buildings and grounds and all of the technical issues associated with these assets, including architectural systems, heating and cooling systems, electrical systems, and grounds and custodial maintenance. Utility systems, including central plant and distribution systems, are also usually under the purview of the facilities manager. In addition, a

facilities manager may have responsibility for such services as parking, transportation, mail, and security. To support these many services takes budgeting, accounting, personnel, and other systems that must be overseen by the facilities manager.

Thus, the breadth of a facilities manager's role is really two dimensional. In one dimension, it crosses many activities with many different characteristics, and in another dimension, it requires specific knowledge and skills within one activity area.

It is not surprising then that the informed facilities manager looks to other resources to help with this plethora of management issues. These resources are found through research and with staff, peers, professional associations, and consultants. The nature of the information needed is as varied as the activities themselves. One form of information commonly used is benchmarking. However, because the facilities manager is responsible for so many activities, it can be overwhelming to try to develop, monitor, and benchmark so many areas. Thus, it makes sense to condense the organization into a more reasonable number of benchmarking areas.

## Four Core Competencies

It is apparent that an excellent facilities manager needs tools that allow a balanced approach to managing these many and diverse activities. Much like the balanced scorecard described in Chapter 2 and applied in the Strategic Assessment Model (SAM), there must be methodologies that ensure that the facilities manager is continually analyzing and balancing priorities and resources. But what should be balanced? What should that balance be? Where should the focus be? What tools can be used to benchmark an organization's components?

In an attempt to narrow this breadth of professional oversight and bring some level of order to an organization's many activities, APPA has identified four core competencies that encompass the broad range of facilities management oversight:

1. General administration and management
2. Maintenance and operations

3. Energy and utilities systems
4. Planning, design, and construction

These four core competencies were identified during the development of the third edition of APPA's handbook *Facilities Management: A Manual for Plant Administration*. After considerable debate, the editorial board decided that a facilities management organization's activities could be characterized by one or more of these four core competencies. At the same time, APPA was also in the process of redesigning its Institute for Facilities Management in response to a need to update the program and add new material about new responsibilities. The form the Institute design team chose to follow was that of the new *Facilities Management* manual. In addition, the three professional development programs of APPA's Leadership Academy provide another resource that is designed to address many of the areas within the four core competencies. Thus, APPA now has an integrated set of educational resources designed around the four core competencies of facilities management.

### General Administration and Management

This competency area consists of the many supporting activities of a facilities organization. It encompasses such areas as human resource management, which includes recruitment, employee relations, training and development, and workforce effectiveness. It also includes other support functions such as financial management, budgeting, accounting, information management systems, service contracting, and risk management.

These are the types of activities that do not directly support the institution's assets but provide the underlying structure that allows the more directly supporting activities to be managed. Thus, another element of general administration and management are such skills and activities as leadership and management skills, planning skills, and decision-making and communication skills that are used to effectively guide and oversee all of the facilities management organization's activities.

### Maintenance and Operations

This competency area consists of many activities that directly support the physical assets of the institution. It includes such activities as operating and maintaining building systems such as the architectural, mechanical, electrical, and specialty systems. It also includes plant services such as custodial services, grounds operations and maintenance, and solid waste management. In addition, other campus services such as parking, transportation, security, and environmental health and safety may also be included. To support these activities, work management systems and purchasing and inventory systems are often found in the facilities management organization. Also, there are usually processes involving physical asset evaluations and assessments to ensure that capital renewal is a part of the strategic planning process.

### Energy and Utilities Systems

This competency area consists of the many activities involved with the purchase, generation, distribution, and management of an institution's energy and utility resources. The utilities cross a broad breadth of technical systems including everything from generation or purchase of electrical energy production and distribution of steam, hot water, and chilled water to the sanitary sewer and storm systems. Quite often, the facilities manager is also responsible for the telecommunications system, energy management system, and other sophisticated new technologies. These systems quite often are governed by many and complex federal and state regulations that require another entire set of intellectual and management skills.

### Planning, Design, and Construction

This competency area consists of the many activities involved with space and property management activities and the design and construction of facilities. These activities vary from the broad campus master planning and campus infrastructure issues to the specific activities of designing and building facilities. In addition, it includes such activities as managing the institution's space and real estate.

## Application

The concept of four core competencies can be combined with the Strategic Assessment Model shown in Figure 17. Each of the core competency areas has financial issues, internal processes, a need for innovation and learning, and customers who need to be satisfied. Thus, for example, a facilities manager could evaluate the overall general administration and management competency for appropriate financial resources by comparing facility operating dollars per gross institutional expenditures over time or with other institutions. Or, the facilities manager can look at internal processes and compare attendance, backlog of work, or safety.

Similarly, the facilities manager can evaluate the organization's effectiveness in maintenance and operations of buildings and grounds and use the four criteria of SAM as a tool in that evaluation process. For example, where does the organization stand in facilities operation dollars per current replacement value, safety, investment in training personnel, and percentage of satisfied customers?

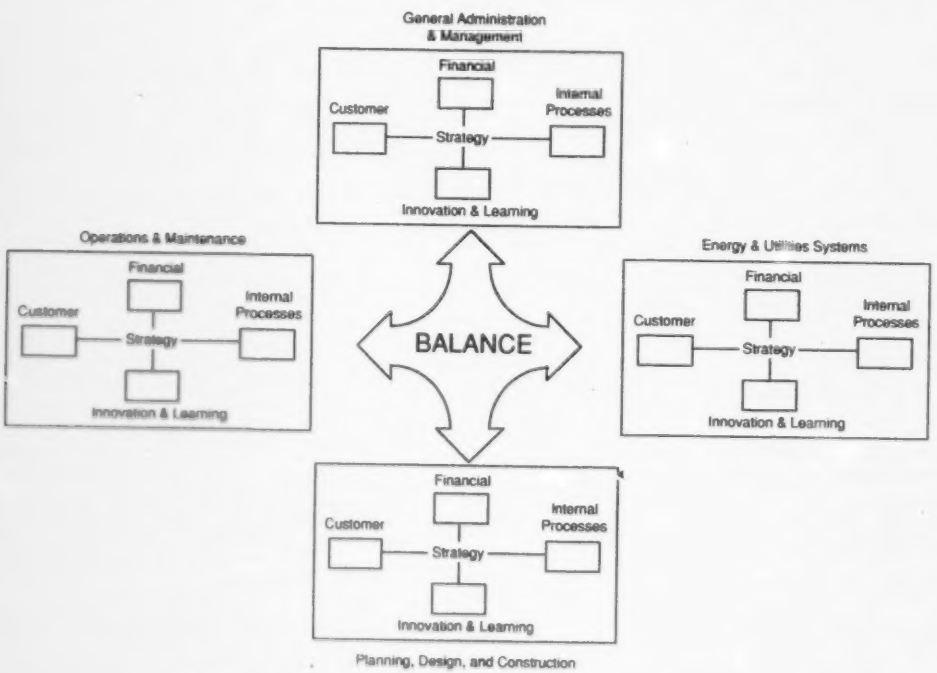


**Figure 17:** *SAM and the Four Core Competencies*

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Focusing on the four core competencies, rather than the many and sometimes overwhelming activities that a facilities manager has to manage, makes it easier to choose benchmarks to evaluate the effectiveness of an organization. Finally, although it is appropriate to evaluate the effectiveness of an organization within these four core competencies, it is also important that the organization be balanced overall. Thus, it is recommended that the facilities manager not only evaluate the organization within the four core competencies, but also assure that SAM is applied across the entire organization. This cross-organizational assessment will ensure that there is a balance among the four competencies. In this way, the Strategic Assessment Model, combined with APPA's four core competencies, ensures that the facilities manager has a tool that supports the breadth as well as the depth needed in the organization.

## Summary

It is important that a well-balanced organization have minimal levels of competency in the four core competencies and that resources and oversight are provided to ensure that all core competencies are properly developed, monitored, and managed. Identifying and condensing these many and diverse activities into four manageable areas helps to bring a focus and a balance in organizational priorities.

Any benchmarking process must provide a means of ensuring that resources are applied across the broad range of activities and to a level that has a basis in institutional priorities. By looking at these four core competencies and ensuring that each area is continually monitored, supplied resources, and developed as necessary, a facilities manager can be confident that the organization is balanced and is competent and supportive of the institution's mission.

Chapter 4

# More than a Feeling: Deployment of SAM within Baldrige

Tom Harkenrider

There are basically three states of change:

1. "It can't be so."
2. "If it is so, it can't be very important."
3. "Hey, we knew it all along!"

Salk, 1994

The year was 1990 when Jack Hug, assistant vice chancellor at the University of California/San Diego, announced that he was arranging to participate in a Baldrige Best Practices Site Visit at the Wallace Company. A number of his colleagues responded, "Who's Baldrige?"

During the next year, the Salk Institute for Biological Studies was among the first to apply elements of the Baldrige criteria in a Request for Proposal for contracted security services and a construction contractor selection process (APPA, 1994). Coincidentally, a number of Salk Institute administrators and fellow colleagues responded the same way as Hug's.

Baldrige has now become a familiar name in quality leadership circles, and APPA has cloned a close cousin: SAM, the Strategic Assessment Model. Some of today's facilities managers may be quick to proclaim that SAM and Baldrige share the same fountain of youth. If so, how strong is this new relationship and what does its future look like?

## Performance Excellence: The Common Denominator

The National Institute for Standards and Technology (NIST) is the administrator of the Malcolm Baldrige National Quality Award. According to NIST, the Baldrige criteria for performance excellence are used by thousands of organizations as a general performance excellence model. They claim that the award is designed to help organizations deliver ever-improving value to customers while improving organizational performance and capabilities. One validation of this claim is that more than 1.5 million copies of the Baldrige assessment instrument have been requested from NIST since its publication in 1998. Another validation is that there are more than 40 state and regional organizational performance assessment programs throughout the country that are modeled or replicated from the Baldrige assessment instrument.

Beyond that, APPA has been following the growing interest in the Baldrige by its membership through its Professional Affairs Committee and has even drafted Baldrige assessment criteria into potential revisions to its Award for Excellence in Facilities Management and Facilities Management Evaluation Program. Given the fact that the Baldrige is apparently withstanding the test of time and is transcending beyond the quality manager's flavor-of-the-month club, it would make sense for SAM to consider Baldrige as one of its mentors in the form of some common denominators.

One common denominator between SAM and Baldrige is related to the measurement of performance excellence (i.e., "metrics" or "performance measurement"). The other is related to what Bob Hascall, associate vice president for facilities at Emory University, refers to as "global vision" or "balanced perspective." SAM measures performance excellence in four categories, whereas the Baldrige uses

seven categories. SAM, a performance assessment metric model, would be located within one of the Baldrige categories, titled Information and Analysis. If the elements of SAM's balanced scorecard categories were unbundled, they would also fall directly within the Baldrige categories of Customer and Market Focus, Human Resource Focus, Process Management, and Business Results. In essence, SAM and the balanced scorecard are categorical elements found within the Baldrige.

It is not necessary to study the Strategic Assessment Model in detail to become convinced that SAM and Baldrige share a common genetic structure. In fact, the Baldrige can seem to be extremely intimidating at first glance. Figure 18 shows a condensed application outline for Baldrige, including the performance excellence criteria. The seven categories of performance excellence are prefaced with a business overview that should provide the overview for all of the categorical descriptions.

Although the Baldrige appears to be a linear model, it is actually an interactive system (Figure 19), where the first three categories (Leadership, Strategic Planning, and Customer and Market Focus) represent leadership's attention to strategy and customers. The last three categories (Human Resource Development and Management, Process Management, and Business Results) represent the outcomes that the employees and processes produce. Customer- and Market-Focused Strategy and Action Plans link leadership's focus on results that should provide the knowledge to drive improvements.

The foundation of the performance excellence assessment system is derived from the middle category, Information and Analysis, which makes it a fact-based system for organizational improvement. SAM is the categorical equivalent to this Baldrige component and is positioned to provide the same level of fact-based assessment and organizational improvement support for the facilities management profession.

## Banded Levels of Performance Excellence: The Common Benchmarking Language

One of the keys to the success of Baldrige is the scoring system (Figure 20), because it offers a clear and consistent means of providing

**1.0 Business Overview**

- 1.1 Basic Description of the Organization
  - a. Nature of Products and Services
  - b. Size, Location, and Type of Ownership
  - c. Major Markets and Types of Principal Customers
  - d. Employee Base Profile
  - e. Use of Major Equipment, Facilities, and Technologies
- 1.2 Customer Requirements
  - a. Key Customer Requirements for Products and Services
- 1.3 Supplier and Partnering Relationships
  - a. Types and Numbers of Suppliers of Goods and Services
  - b. Most Important Types of Suppliers, Dealers, and Other Services
  - c. Special Requirements, Relationships, and Limitations with any Suppliers and Partners
- 1.4 Competitive Factors
  - a. Relative Size and Growth in the Industry
  - b. Numbers and Types of Competitors
  - c. Prinicipal Factors that Determine Competitive Success, such as Productivity Growth, Cost Reduction, and Product or Service Innovation
  - d. Changes that Affect Competition
- 1.5 Other Factors
  - a. New Ventures and Markets
  - b. New Business Alliances
  - c. New Technologies
  - d. Regulatory Influence and Issues
  - e. New Strategic Directions
  - f. Unique Factors

**2.0 The Seven Baldrige Categories of Performance Excellence**

- 2.1 Leadership
  - a. How the Senior Leadership Staff Guides Direction Setting and Influences Dynamic Leadership Processes
  - b. How the Organization Addresses Good Public and Civic Responsibilities and Practices
- 2.2 Strategic Planning
  - a. How the Setting of Strategic Directions Strengthen Performance and Competitive Position
  - b. How the Strategy and Action Plans are Described and Deployed

2.3 Customer and Market Forces
   a. How the Long-Term Requirements, Expectations, and Preferences of Current and Potential Customers are Determined in order to Anticipate Needs and Identify Opportunities
   b. How Customer Satisfaction is Determined and Improved in order to anticipate Needs and Identify Opportunities

2.4 Information and Analysis
   a. How the Selection and Management of Information Supports and Improves Action Plans, Key Processes, Competitive Position and Performance
   b. How Progress of Plans and Goals is Assessed with Respect to Performance and Key Areas of Improvement are Identified

2.5 Human Resource Focus
   a. How Employee Work Design, Compensation, and Performance Recognition Approaches Support the Achievement of Organizational Performance Excellence and Professional Growth
   b. How Organizational Action Plans are Supported by Employee Training and Professional Development
   c. How Employee Satisfaction, Well Being, and Motivation are Supported by the Work Environment

2.6 Process Management
   a. How Key Delivery Processes are Designed, Implemented, and Improved
   b. How Support Delivery Processes are Designed, Implemented, and Improved
   c. How Outside Service Provider's Processes and Partnering Relationships are Designed, Managed, and Improved

2.7 Business Results
   a. Summary of Customer Satisfaction and Dissatisfaction Results
   b. Summary of Key Financial Performance Results
   c. Summary of Employee Satisfaction, Safety, and Well-Being, Job Enrichment, and Performance Feedback Results
   d. Summary of Vendor and Service Provide Satisfaction and Partnering Relationship Results
   e. Summary of Key Operational Performance that Contributes to Achievement of Organizational Effectiveness

**Figure 18:** *The Seven Baldrige Categories of Performance Excellence* (Source: Constructive Concepts, Inc.)

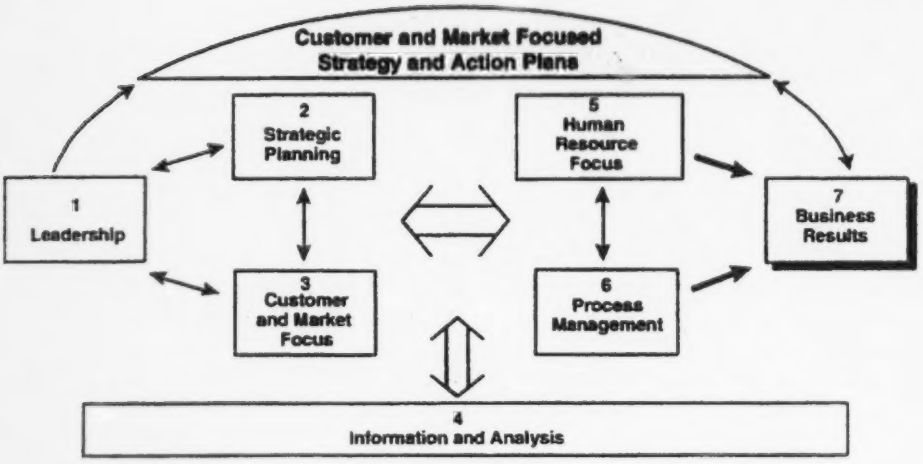


**Figure 19:** *Baldrige Criteria for Performance Excellence Framework: A Systems Perspective* (Source: *1999 Criteria for Performance Excellence.* Gaithersburg, MD: National Institute for Standards and Technology; 1999)

quantitative performance assessment. Baldrige also offers the means to quantify performance excellence for otherwise intuitive assessments.

For quality leadership practitioners, Baldrige is indeed "more than a feeling." The deployment of SAM within the Baldrige framework provides the means to quantify and benchmark levels of performance excellence within five bands.

Specifically, SAM uses five levels of statistical groupings to describe levels of performance assessment. Baldrige takes the next step by applying scoring weights to each band and applying total possible scoring points for each performance excellence assessment category.

SAM uses 18 individual performance items within four categories. Baldrige uses 20 items within seven categories. Baldrige assessment participants speak a common benchmarking language in terms of their quantified performance. Statements about being a performer within a given band or point range has the same meaning to all organizations regardless of culture, type, or size. For example, Baldrige assessment participants talk about being "450-point organizations

| SCORE | APPROACH/DEPLOYMENT |
|---|---|
| 0% | ■ no systematic approach evident; anecdotal information |
| 10% to 30% | ■ beginning of a systematic approach to the primary purposes of the Item<br>■ early stages of a transition from reacting to problems to a general improvement orientation<br>■ major gaps exist in deployment that would inhibit progress in achieving the primary purposes of the Item |
| 40% to 60% | ■ a sound, systematic approach, responsive to the primary purposes of the Item<br>■ a fact-based improvement process in place in key areas; more emphasis is placed on improvement than on reaction to problems<br>■ no major gaps in deployment, though some areas or work units may be in very early stages of deployment |
| 70% to 90% | ■ a sound, systematic approach, responsive to the overall purposes of the Item<br>■ a fact-based improvement process and organizational learning/sharing are key management tools; clear evidence of refinement and improved integration as a result of improvement cycles and analysis<br>■ approach is well-deployed, with no major gaps; deployment may vary in some areas or work units |
| 100% | ■ a sound, systematic approach, fully responsive to all the requirements of the Item<br>■ a very strong, fact-based improvement process and extensive organizational learning/sharing are key management tools; strong refinement and integration — backed by excellent analysis<br>■ approach is fully deployed without any significant weaknesses or gaps in any areas or work units |

| SCORE | RESULTS |
|---|---|
| 0% | ■ no results or poor results in areas reported |
| 10% to 30% | ■ early stages of developing trends; some improvements *and/or* early good performance levels in a few areas<br>■ results not reported for many to most areas of importance to the applicant's key business requirements |
| 40% to 60% | ■ improvement trends *and/or* good performance levels reported for many to most areas of importance to the applicant's key business requirements<br>■ no pattern of adverse trends *and/or* poor performance levels in areas of importance to the applicant's key business requirements<br>■ some trends *and/or* current performance levels — evaluated against relevant comparisons *and/or* benchmarks — show areas of strength *and/or* good to very good relative performance levels |
| 70% to 90% | ■ current performance is good to excellent in most areas of importance to the applicant's key business requirements<br>■ most improvement trends *and/or* performance levels are sustained<br>■ many to most trends *and/or* current performance levels — evaluated against relevant comparisons and/or benchmarks — show areas of leadership and very good relative performance levels |
| 100% | ■ current performance is excellent in most areas of importance to the applicant's key business requirements<br>■ excellent improvement trends *and/or* sustained excellent performance levels in most areas<br>■ strong evidence of industry and benchmark leadership demonstrated in many areas |

**Figure 20:** *Scoring Guidelines* (Source: *1999 Criteria for Performance Excellence.* Gaithersburg, MD: National Institute for Standards and Technology; 1999)







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on the way to 600 should they move from the second band to the fourth band in certain assessment items." SAM participants have the same ability to speak a common language based on how they value the performance of the 18 items with respect to their own campus situations.

One tangible application would be for the campus facilities organizations to benchmark themselves with the for-profit maintenance organizations. Given the same set of performance excellence criteria, this would offer a level playing field for those administrators dealing with the perceived threat of outsourcing. Other applications could be the benchmarking among units within the organization; among organizations within systems; or among systems, Carnegie classifications, or regions.

As long as the same scoring methods are being applied, the total quantities will be consistently meaningful. A 600-point facilities management unit would have the same relative stature as a 600-point business affairs department. That same well-balanced 600-point facilities management department would be able to claim performance excellence superiority over 200-point competitors who only know that 99 cents is less than a dollar or claim an equal footing with senior administrators who only believe that cheap is good.

## The Wonder Years: SAM's First Two States of Change

Although there are always going to be the naysayers and status quo defenders who will discount the merits of change, interest in and application of SAM has managed to grow. SAM is indeed being adopted by an increasing number of organizations as witnessed by the other authors of this publication and several APPA presentations. The Baldrige continues to have its fair share of critics too, but it continues to grow as a commonly used performance assessment model. For example, there are now 42 Baldrige-based assessment programs, more than 2,700 trained examiners, and more than 84,000 criteria packages distributed across the country. This represents a growth rise of approximately 100 percent per year since 1991 when

the first state and local programs were established. SAM is beginning with a base of 100 participants, and a similar growth rate could easily be matched or exceeded.

The Strategic Assessment Model is still in its "wonder years" and has experienced some growing pains. The first round of surveys yielded some misleading statistics and underwent some recalibration. For example, because of the phrasing of a few questions, some responses revealed such things as the staff being absent more than 100 percent of the time! Once such inconsistencies were eliminated, however, the final product turned out to be a substantially representative and statistically valid model.

Appendix A contains a representation of the deliverable that the first round of participants received after the surveys were revised and the results were recalculated. The first chart summarizes the 18 metrics within the four balanced scorecard categories and five performance bands. As a starting point, about 80 percent of the results were grouped into the first band, and this is one of many assumptions that will be challenged and probably revised as a result of user feedback. Level 5 is intended to be the place for stretch goals and best-in-class performance excellence measures, with the levels in between representing milestones for interim improvement.

The next three illustrations represent the findings for the first of the 18 metrics, Annual Facility Operating Expenditures as a Percentage of Current Replacement Value. The next page that the participants received, but is not shown for the sake of protecting confidentiality agreements, is a total comparative tabulation of all participants for this performance measurement item. The rest of the deliverable is arranged accordingly for the other 17 performance indicators.

There will undoubtedly be a great deal of debate among the SAM participants about what the statistics actually represent, because they do not yet have any real correlation to level of quality. Because of this, SAM still has some obstacles to overcome until those issues are resolved. Fortunately for all of those facilities managers who are in some respects still pioneers in the quality leadership movement, SAM can expect to enjoy the same success that Baldrige has obtained because of the similarities mentioned in this chapter.

There are a growing number of organizations in higher education that have adopted the Baldrige and will find that SAM is the logical relationship for their facilities management organizations. As far as the remaining challenges that SAM will have to experience before it can claim Baldrige-level success, another one of Jonas Salk's quotes seems fitting for this situation. In conversations with the author, Salk often claimed that "Not only is necessity the mother of invention, but adversity breeds evolution."

## Tales from the Bright Side: The Third State of Change

Those who now claim that they "knew it all along" are in some very good company. Facilities management professionals can now network within their own state or region with fellow Baldrige practitioners. APPA has a growing number of members who are certified state or national Baldrige examiners who understand how SAM can be developed and used. There are even two facilities management organizations (the University of Southern California in Los Angeles and Emory University in Atlanta) that reached the same conclusion nearly the same time about using the APPA Excellence Award combined with Baldrige for a fully integrated self-assessment process.

There is an intuitive and logical motivation for bringing the Baldrige into the APPA assessment programs. Emory University found that the Baldrige-based APPA document, drafted by Bob Collins at Davidson College, made sense and is planning to participate in their state's Baldrige-based Oglethorpe program in preparation for participating in APPA's Award for Excellence program. Bob Hascall is spearheading Emory's effort and has actually incorporated the APPA/Baldrige assessment processes into their scenario and strategic action plans.

The University of Southern California Business Services Division was the recipient of a best-in-class Baldrige recognition from their statewide Baldrige-based assessment program in 1997. Under the direction of Mo Hollman, USC's Facilities Management Division prepared similar applications for work units within their orga-

nization in 1998 in preparation for an eventual submittal in the APPA Award for Excellence program. The preparation, feedback, and fact-based performance improvement activities that these work units are experiencing will augment the effectiveness of the APPA programs already in place. Both of these organizations will also be able to benchmark their performance with local participants outside of their immediate competencies to learn about and develop practices that would not otherwise be quite so obvious to their peers.

The Baldrige-based quality recognition program in California is administered by a nonprofit organization, the California Council for Quality and Service. Participation in the program has grown exponentially over the past few years, and the program has been widely adopted by institutions of higher education in the state. Cuesta College was the first to participate, with the University of Southern California, University of California System, and Lawrence Livermore Labs following suit. Other participants range from the Navy and Air Force to an inner city K–12 organization, Marvin Elementary in Los Angeles, that defied the presence of a crime-ridden environment and instituted mandatory uniform policies and police patrol internships. Best Practices site visits have offered effective networking opportunities for the facilities management professionals who are now benchmarking their results with a wider range of organizations than ever before.

## SAM and Baldrige: A Relationship with a Future?

Jack Hug, one of the pioneers and early advocates of the quality leadership movement, claims that it all boils down to what he states as "Relationships, stupid." When questioned about that phrase during a presentation at the 1998 annual APPA meeting, he responded, "Well, just go look in the mirror," meaning that relationship building begins from the "inside out." In essence, we should first look within ourselves and within our organizations and understand what we see. This should be done before we expect to engage in meaningful relationships with other individuals and organizations.

This mirror analogy is also reflected in a speech that Soka University founder, Daisaku Ikeda, delivered to their Los Angeles campus on February 27, 1990. Ikeda states in his speech that "ancient mirrors, unlike today's mirrors that are made of glass, could only produce somewhat blurred reflections of images. Bronze mirrors not only reflected poorly but also tarnished very quickly. Therefore, unless they were polished regularly, they became unusable" (page 84). Assuming that we are willing to look at ourselves and our organizations with well-polished mirrors, or as Ikeda states about those mirrors that "reflects the depths of your life" (page 85), we can then begin to establish the kind of relationships that support performance measurement models such as the Baldrige and the Balanced Scorecard.

Whereas Baldrige began as an awards recognition program, it then transformed into a more state and local quality leadership program and eventually into a self-assessment and benchmarking tool. SAM is assuming the same principle-centered characteristics. Facilities managers are finally looking beyond financial and productivity metrics. The balance between customer and employee satisfaction relationships is growing in importance. After all, the for-profit "competition" has been in that "third state of change" for much longer and is rapidly capturing market share. SAM is one of the first assessment tools that can effectively bridge the gap between APPA's nonprofit membership and its counterparts in the corporate world. This is another opportunity for APPA to take the lead in the profession. To take the lead in relationships with a future.

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1. **The Criteria focus on business results.**
The Criteria focus on the key areas of business performance, given below.

> Business results are a composite of:
> (1) customer satisfaction/retention;
> (2) financial and marketplace performance;
> (3) product and service quality, performance, delivery, and innovation;
> (4) operational effectiveness, including productivity and responsiveness;
> (5) human resource performance/development;
> (6) supplier performance/development; and
> (7) public responsibility/good citizenship.

These results cover overall company performance, including financial performance, and also recognize the importance of suppliers, the needs of communities, and the needs of the Nation.

The use of a composite of indicators helps to ensure that strategies are balanced — that they do not inappropriately trade off among important stakeholders or objectives or between short- and long-term goals.

2. **The Criteria are nonprescriptive and adaptable.**
The Criteria are made up of results-oriented requirements. However, the Criteria *do not* prescribe:
   - specific tools, techniques, technologies, systems, measures, or starting points;
   - that companies should or should not have departments for quality, planning, or other functions;
   - how the company itself should be organized; or
   - that different units in companies should be managed in the same way.

All these factors are important and are very likely to change as needs and strategies evolve. Hence, the Criteria do emphasize that such factors be evaluated as part of the company's performance reviews.

The Criteria are nonprescriptive because:

(1) The focus is on results, not on procedures, tools, or organizations. Companies are encouraged to develop and *demonstrate* creative, adaptive, and flexible approaches for meeting basic requirements. Nonprescriptive requirements are intended to foster incremental and major ("breakthrough") improvement as well as basic change.

(2) Selection of tools, techniques, systems, and organizations usually depends upon factors such as business type and size, the company's stage of development, and employee capabilities and responsibilities.

(3) Focus on common requirements within a company, rather than on common procedures, fosters better understanding, communication, sharing, and alignment, while supporting creativity and diversity in approaches.

3. **The Criteria support a systems approach to maintaining companywide goal alignment.**
The systems approach to goal alignment is embedded in the integrated structure of the Criteria and the results-oriented, cause-effect linkages among the Criteria items.

Alignment in the Criteria is built around connecting and reinforcing measures, derived from the company's strategy. These measures tie directly to customer value and to overall performance. The use of measures thus channels different activities in consistent directions without the need for detailed procedures or centralization of decision making or process management. Measures thus serve both as a communications tool and a basis for deploying consistent overall performance requirements. Such alignment, then, ensures consistency of purpose while at the same time supporting speed, innovation, and decentralized decision making.

A systems approach to goal alignment, particularly when strategy and goals change over time, requires dynamic linkages among Criteria items. In the Criteria, action-oriented learning takes place via feedback between processes and results through cycles of learning.

The learning cycles have four, clearly defined stages:

(1) planning, including design of processes, selection of measures, and deployment of requirements;

(2) execution of plans;

(3) assessment of progress, taking into account internal and external results; and

(4) revision of plans based upon assessment findings, learning, new inputs, and new requirements.

4. **The Criteria support goal-based diagnosis.**
The Criteria and the Scoring Guidelines make up a two-part diagnostic (assessment) system. The Criteria are a set of 20 performance-oriented requirements. The Scoring Guidelines spell out the assessment dimensions — Approach, Deployment, and Results — and the key factors used to assess against each dimension. An assessment thus provides a profile of strengths and opportunities for improvement relative to the 20 basic requirements. In this way, assessment leads to actions that contribute to the results composite described in the box above. This diagnostic assessment is thus a useful management tool that goes beyond most performance reviews, and is applicable to a wide range of strategies and management systems.

**Figure 21:** *Key Characteristics of the Baldrige Criteria*

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Chapter 5

# What is Benchmarking?

Mohammad H. Qayoumi

Management journals in the 1990s were saturated with a plethora of new concepts such as total quality management (TQM), continuous quality improvement (CQI), business process engineering (BPR), just-in-time (JIT) production, activity-based management (ABM), and reliability-centered management (RCM). Each concept claimed improvements of miraculous proportions. Benchmarking has also been placed within this alphabet soup of organizational salvation. The obvious difference between benchmarking and the other concepts is the lack of a three-letter acronym. More importantly, benchmarking is the least understood and most misrepresented concept among these, especially in higher education circles.

Many universities, familiar with comparative cost studies, over time baptized similar studies, without any changes in process or approach, as benchmarking studies. The practice became so prevalent that one of the major higher education associations began providing "benchmarking" studies that have more in common with a comparative cost analysis than benchmarking. And some organiza-

tions call any informal networking among professional colleagues benchmarking.

Although these activities may have some elements of benchmarking, in most cases the studies lacked the substantive elements found in true benchmarking. The fundamental difference between comparative costing and benchmarking is that comparative costing is input-based whereas benchmarking is outcome-focused. Comparative cost analysis has usually been used to defend one's budget or justify budgetary increases to senior management, boards of trustees, and legislators, and organizational improvement has not been the main motivation behind them. The emphasis of cost analysis is to "look good rather than being good."

Benchmarking, however, focuses on a genuine commitment and willingness to fundamentally change an organization to enhance the overall effectiveness and efficiency of its critical success factors. Comparative costing usually involves a few individuals in an organization, most often in the institutional research departments, whereas benchmarking involves most of the organization. Benchmarking is a systematic approach to organizational change where the gap between current performance is compared with vision. It is the first the step toward creating a learning organization where the generative energies of the group are focused. This chapter provides a general overview of benchmarking; the typical benchmarking processes are further described in Appendix D.

## Introduction

Benchmarking is a systematic process to continuously measure and compare performance against industry leaders or world-class organizations. It is an action-biased approach of gaining information to enhance performance, which will improve efficiency and effectiveness of an organization and lead to increased competitiveness. According to the American Productivity and Quality Center (APQC), "Benchmarking is the practice of being humble enough to admit that someone else is better at something, and being wise enough to match and even surpass them at it."

Similarly, Carla O'Dell defined benchmarking as "...the process of understanding what is important to your organization's success, understanding your own processes, finding and learning from others who do these processes better than you do, then adopting that learning to improve your own performance." This definition means that an organization has articulated its vision, mission, and core values. Based on these, it knows what is important to its success and has identified its critical success factors. The organization has clearly linked its core processes to its mission and has defined a set of measures that determine baseline performance. Finally, it has sought and found others whose performance is better than its own and is learning how it can adopt the practices or those organizations to improve its performance.

Benchmarking can assist in defining realistic goals with strategic targets. It can provide focus and a sense of urgency to strive for excellence and seek breakthrough improvements and innovations. In addition, benchmarking creates a higher level of sensitivity of changing customers' expectations and industry's best practices; thus, the process of business change can be accelerated. This sensitivity will eventually result in more customer satisfaction, which will be a competitive advantage for the organization.

Benchmarking prevents "reinventing the wheel" because the organization will adopt practices that have been proven by others. Benchmarking can help the organization overcome inertia and complacency and minimize negative comments from skeptics.

## Benchmarking Evolution

Benchmarking should be based on core processes of an organization. However, as techniques have become more robust in their maturity cycle, benchmarking has evolved to cover strategic issues. Based on this evolution, benchmarking can be divided in three categories.

### *Process Benchmarking*

In process benchmarking, the focus is operational-level investigation of the performance of specific core processes. The emphasis is

on improving process capability, effectiveness, efficiency, cost, or throughput to enhance bottom-line results.

#### *Performance Benchmarking*

Performance benchmarking is more than process benchmarking and emphasizes the overall competitive position of an organization. The focus is on metrics such as cost, price, quality, speed, and performance.

#### *Strategic Benchmarking*

The emphasis of strategic benchmarking is to determine how others compete and identify approaches that make high-performing organizations successful. Strategic benchmarking normally looks at other industries and seeks lessons that can be learned from other sectors. This type of benchmarking is the most advanced and complex effort and requires considerable resources and time to complete; however, most breakthrough ideas come from such efforts. Strategic benchmarking is only recommended for organizations that are change leaders in a particular industry sector.

### Types of Benchmarking

#### *Industry Group Comparison*

Industry group comparison entails measuring various performance aspects of an organization—such as customer satisfaction, efficiency, and productivity—and comparing them with others in the industry or profession. The organization acquires industry comparison data and assesses how the organization compares with best practices in the group. This is not benchmarking in the true sense of the definition.

#### *Best Practice*

Best practice involves using information from the literature—books, journals, and consultant reports—to identify best practices in the industry and try to adopt them. Such sources may not have useful metrics needed or the specific conditions that may not be relevant for other organizations. Although this approach is not benchmarking,

per se, it may titillate interest and commitment to begin a true benchmarking effort.

### *Internal Benchmarking*

Internal benchmarking is where many organizations begin their benchmarking efforts. Internal benchmarking involves a systematic approach to seek best practices within the organization, analyze the enabling factors for their performance, and try to emulate these factors across the organization. Corporations that are protective of their processes and have no desire to share their knowledge base with other companies usually revert to internal benchmarking.

### *Cooperative Benchmarking*

Cooperative benchmarking is when two or more organizations agree to share data on a particular process or several processes for a particular time frame. Finding a benchmarking partner requires creating a set of selection criteria that are developed internally or with the assistance of a consultant. A benchmarking clearinghouse can identify possible candidates based on these criteria. Proper negotiation is needed then to see whether other firms or institutions are also interested. These other organizations can be within one's industry or outside the industry.

### *Competitive Benchmarking*

In competitive benchmarking, a company seeks legal ways to learn about its competitors without their cooperation and then tries to emulate some of their competition's improvement practices. In reality, this process is nothing more than reverse engineering.

### *Consortium Benchmarking*

Consortium benchmarking is a process developed by the American Productivity and Quality Center (APQC). The idea behind this approach is that because the cost of benchmarking is expensive, it makes sense to find a number of institutions that have an interest in participating in a study. The members of the consortium then can share the

cost of the study. This approach works well for benchmarking studies that are wide and shallow, because the group finalizes the final scope of the project, which means that every participant ends up compromising on its original desired scope.

For a detailed description of the formal benchmarking process, see Appendix D.

### Links to Malcolm Baldrige Criteria

The Malcolm Baldrige Criteria is a system of performance excellence metrics that was designed in the mid-1980s to enhance the competitiveness of U.S. industries. It serves as a tool to assess the overall performance of an organization and identify opportunities for improvement to enhance overall organizational effectiveness. (See Chapter 4 for information on how APPA's Strategic Assessment Model fits with the Baldrige program.) The Baldrige criteria are based on the following core values that form the necessary foundations for an outcome-oriented organization:

- Customer-driven quality
- Leadership
- Continuous improvement
- Valuing employees
- Fast response
- Design quality and prevention
- Long-range view of the future
- Management by fact
- Partnership development
- Company responsibility and citizenship
- Results focus

These core values are included in seven highly integrated categories:

- Leadership
- Strategic planning
- Customer and market focus
- Information and analysis
- Human resources focus

- Process management
- Business results

The most important phenomenon to recognize about these categories is the interrelationship among them (see Figure 22). For instance, the first three categories demonstrate the senior leadership's focus on the future directions of the organization. Similarly, the last three categories represent the result triangle, namely how an organization uses its human resources and its processes to obtain desired results. The fourth category serves as a foundation for fact-based management that supports both triangles. The links between the two triangles represent the critical relationship between directions of and actual outcome of an organization.

Using these categories, an organization can systematically assess its performance level and determine the strengths and opportunities for improvements. The benchmarking process takes a narrow and specific subset of one or more categories and seeks organizations that excel in that particular area. Therefore, Baldrige assessment and benchmarking structurally have a lot in common. With

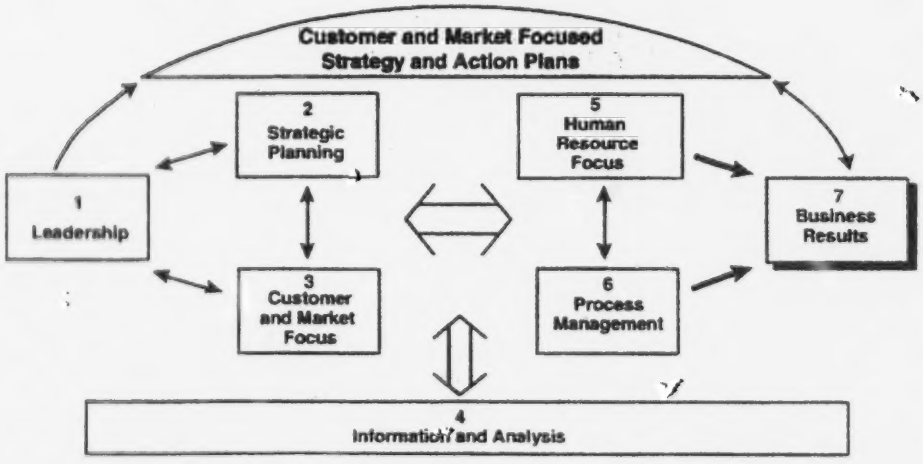


**Figure 22:** *Baldrige Criteria for Performance Excellence Framework: A Systems Perspective* (Source: *1999 Criteria for Performance Excellence.* Gaithersburg, MD: National Institute for Standards and Technology; 1999)

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Baldrige assessment, the organization is known and its overall performance is assessed based on the predetermined criteria. With benchmarking, the criteria are defined and, based on that information, the organization seeks firms who are superior performers in these criteria only. Both Baldrige and benchmarking require sharing of information with others. With Baldrige, part of the agreement is that the winners share their best practices with others. With formal benchmarking, specific information about certain processes must be shared only among partners.

## Conclusion

Benchmarking must directly contribute and provide input to the strategic directions of the organization. In other words, it should be part of the planned changes that must take place to improve the competitive position of the entity. This means that benchmarking should not be sidetracked to nonstrategic efforts. Senior management must play a key role in selecting areas for benchmarking and be fully committed to implementing its findings. Otherwise, a significantly large percentage of resources will be spent on gathering the data, which is an easy task, and a small amount will be left for the implementation, the most difficult but important portion of the project.

Unfortunately, many associated rituals and fetish minutia can be associated with benchmarking, which can cloud the substantive issues and deepen the mythology. Benchmarking is no silver bullet that can quickly and magically improve everything for the better. It requires strong commitment from senior leadership and a great deal of hard work by many others in the trenches. However, if done correctly, the dividends far outweigh the collective effort.

The most important and enduring affect of benchmarking is changing the cultural fabric of an organization; namely, realizing that there are others who perform a particular process better than the organization does and that the organization is willing to learn from them. This change inevitably paves the road for continuous quality improvement, a journey that will finally lead to sustained excellence.

Chapter 6

# Conclusions: Where Do We Go from Here?

Margaret P. Kinnaman

APPA's Strategic Assessment Model has experienced many fits and starts along its journey to the present. In my travels throughout APPA's various regions, I have been privy to many jokes about SAM. One region made an analogy of SAM to surface-to-air missiles; their point was that surface-to-air missiles are much more accurate in hitting a target than are facilities managers. Despite the jokes and jabs, I have not heard anyone say that SAM should be put to rest. I think everyone realizes that SAM is the type of tool that will help facilities managers focus on self-improvement in their complex and ever-changing environments.

Using the tool will also help facilities managers speak in the language of business and tell their facilities stories to campus decision makers. In an environment in which all areas are striving for excellence, facilities managers need to be able to credibly make their point. In the wise words of our past president, Pieter van der Have, "Using the golf analogy, SAM is a tool that starts to establish pars for excellence for the facilities management profession. You're always aware of the par, but it is your particular strategy that determines

what levels you are striving to achieve." The very publication of this book indicates a continued commitment to the SAM initiative.

So what does the future hold for APPA's Strategic Assessment Model? The APPA Board of Directors recently committed resources to establish a new task force to revitalize the Strategic Assessment Model. The charge was articulated as establishing an inventory of reliable and meaningful performance indicators that would greatly increase the credibility of the facilities management professional. The task force met in May 1999 to revisit the original Strategic Assessment Model, review its purpose, discuss how it could be used by educational facilities professionals, review the model's structure, make appropriate changes, clarify definitions, and identify how the tool could be validated in the future.

One item for discussion was the appropriateness of the original metrics that had been selected. Are they truly the ones that are indicators of overall organization health? Can these metrics be used to build either a case for excellence or justify a case for privatization? The task force determined that its focus should be on the truth behind the numbers and on capturing and applying best practices or success stories as a way to improve service delivery models.

## What SAM Is and What it Is Not

Is SAM an example of benchmarking or is it a collection of performance indicators? This is a question that has been asked from the inception of the Strategic Assessment Model. The task force members agreed that the model is a collection of performance indicators and is not specifically an example of the process of benchmarking.

How is the Strategic Assessment Model different from APPA's biennial Comparative Costs and Staffing (CCAS) Report? CCAS is seen as an effort to collect data and performance indicators and is operational in nature. Users can pick and chose which performance indicators are important for them.

The Strategic Assessment Model, on the other hand, is a strategic tool that looks at specific performance indicators that are indicative of overall organizational effectiveness and brings them together in a model that captures levels of effectiveness for participating in-

stitutions. As Pete van der Have said, we are basically creating "pars for the profession."

Once an institution has access to the information, it could choose to use it for self-improvement or to benchmark its performance with peers, which, in turn, could lead to best practices that might eventually add value to our educational institutions.

## Identifying New Performance Indicators

Next came the task of identifying the performance indicators that are important in assessing an organization's overall effectiveness. The task force decided to look across each of APPA's four core competency areas. In addition, the task force agreed that both quantitative and qualitative measures would be used where appropriate; yes/no questions would not be used in future surveys. The following are just a few of the items identified as possible new performance indicators or metrics and are being considered for inclusion in the Strategic Assessment Model:

- Percentage of new construction receiving maintenance dollars
- Percentage of energy conservation dollars of total utility dollars
- Capital project soft dollars as a percentage of total project cost
- Estimated construction cost as a percentage of actual cost
- Preventive maintenance backlog in days
- Work order backlog average in days
- Managers/administrators as a percentage of the total workforce

Because customer perceptions of service are a major focus of the SAM model, the consortium hopes to provide members with both a customer and organizational climate survey instrument that could be adapted and added to the SAM toolkit.

Phase II SAM will also involve the development of case studies or SAM success stories. The group hopes to capture the experience of organizations who have used SAM, how they've done so, and what has been their results. Currently, at least five brave organizations have applied SAM to their environment and achieved a positive result. Some task force members also envision a software or Web-

based tool that would assist facilities managers in tracking and displaying their improvement over time.

Finally, the consortium needs to identify a way to apply the concepts of continuous improvement to the model. One strategy being discussed is to identify a group of several hundred willing participants who will complete a survey every two years as a way to update the levels of effectiveness or pars for the profession.

SAM has an exciting future. This has been and will continue to be an important research project that, over time, will prove to be an essential tool in the toolkit for educational facilities managers. Those organizations that participated in the original SAM consortium are elated about the development of this primer and have been encouraged every step of the way by enthusiastic membership feedback and support.

We look forward to the dynamic evolution and application of APPA's Strategic Assessment Model.

# Appendix A

# SAM Survey Results

Laura Long

In an article published in *Facilities Manager* in January 1996, and updated as Chapter 1 of this book, Maggie Kinnaman defined the brainstorming process that took place in Arlington, Virginia, in 1995 that led to the birth of the Strategic Assessment Model (SAM). The immediate need was to seek and find as many colleges and universities as possible to participate in the first APPA facilities benchmarking endeavor. Nearly 100 institutions volunteered to help establish the initial database, which led, ultimately, to the information in this appendix.

Unfortunately, the original questionnaire from which the survey participants worked was less than clear on some of the questions (understandable because this was the very first SAM). That resulted in quite a few responses that were unacceptable without rephrasing the questions and soliciting more valid data. Therefore, a "data scrubbing" team was set up to telephone and fax 45 or so institutions to rethink, recalculate, and redefine some of the original responses.

Even with this scrubbing effort, the response was less than 100 percent, so the team was left with no choice but to discard the in-

valid responses in question. For example, a few institutions indicated that their staff was absent more than 100 percent of the time. Because this is not possible, the response had to be discarded. In addition, there were a few responses that registered either extremely high or low. If such a response was feasible for some schools, or if consultation with the manager involved confirmed the response, it was retained.

And so, with this additional effort and extension of time, the result is the Strategic Assessment Model you now hold in your hand. We trust it will not only fulfill the ideal the original team in Virginia set for it, but that you and your staff will find it both informative and challenging. With it, we believe the three strategic goals originally established by APPA can be met: we can measure ourselves against others; we can measure ourselves against ourselves, determine our strengths and weaknesses, and raise our performance standards; and we can, if we wish, share our strengths with other institutions.

## Interpreting the Data

The first chart to examine is the APPA/SAM matrix (Figure 23). Across the top, this chart is arranged in the four perspectives of the Kaplan and Norton balanced scorecard: namely, Financial, Internal Process, Innovation and Learning, and Customer Satisfaction. These are the four aspects of management that drive performance, and APPA selected 18 processes for measurement and comparison in this first SAM. The chart displays these 18 processes in an array of five levels, with Level 1 being that at which 80 percent of the institutions perform. Fewer perform at the higher Levels of 2 and 3, and Level 4 represents the processes that might be the best in the population of the benchmark study. Level 5 has been established to show where high-performing institutions can aspire to go by "stretching" their standards beyond best practices. Use this chart to see where your institution falls within each of the 18 benchmarks and how you compare with your peers.

Following the SAM layout, we begin to deal with the first of the 18 benchmarks; namely, Annual Facility Operating Expenditures as

a Percentage of Current Replacement Value (CRV). The text defines the benchmark and is followed by a chart depicting the distribution of responses from all members of the benchmark population.

Because small colleges should not necessarily be compared with large research universities, for instance, or campuses in the extreme north to campuses in the deep south, the data have been collated into the seven APPA regions and seven kinds of institutions in accordance with the Carnegie classification for higher education. The distribution in each of those categories includes the count (number of schools responding to that particular benchmark), average, mean (the central value), the 80th percentile, minimum, maximum, and—for those who like to work with the bell-shaped curve—the standard deviation from the mean. The 80th percentile is similar to Level 1 performance standard on the summary chart discussed previously. Eighty percent of the respondents fall below (or in some cases above) the number shown.

The second metric under analysis is Annual Plant Renewal Expenditure as a Percentage of CRV. Again, there is a Carnegie chart with definitions and survey results. In this manner, all 18 metrics are analyzed in this initial APPA/SAM report.

There are four factors we should emphasize as you begin to interpret the data in these charts.

1. Even though we compute percentages to two decimal points on the charts, remember that these numbers are, by the manner in which they are derived, imprecise. Take CRV as an example. Because building costs vary from region to region, and from simple classroom construction to complex laboratories, the facilities manager of each campus will be working with different kinds of estimates. So think of the percentages more as indicators than as precise descriptors.
2. Keep in mind that raw scores give little or no indication of quality. For example, operating expenses as a percentage of CRV may be minimal for Cactus Tech, while maximal for Ashgrove U. So the astute manager has to be able to analyze whether the facilities dollars are being well spent. Does saving money equate to shorting on services? Does spending money equate to value? Only you can speak to that.

3. The methodology of the SAM places 80 percent of the participating institutions at Level 1. But that's a lot of company, isn't it? The manager must make the effort to locate his or her school among the pack, and this can best be done as we collect more and better data from our colleague institutions.
4. As a facilities manager, you must evaluate your performance not only in relation to other campuses, but in relation to your own goals, priorities, and strategies. For example, your responses may have been lower than normal in this particular year in terms of operating expenses, but if you were planning to allocate some or all of that money elsewhere in the future, then your scores reflect your strategy.

The SAM analysis report sent to participating institutions included a 3.5" diskette to facilitate data presentation. The bar charts contained in the participant's report were given as PowerPoint files and can be printed in black and white or color. They can also be printed on paper for distribution or on overhead transparencies for presentation. The diskette also contained an Excel spreadsheet with tables for each performance indicator, as well as data fields used for calculation and cohort information.

## Conclusion

By participating in this initial APPA/SAM, the nearly 100 facilities teams have helped to establish the first facilities benchmarking database on which future benchmarking thrusts can build. In short, they have helped to set the current standard for the industry. As those standards rise higher and higher in the years ahead, may your facilities team ride the crest to outstanding success. After all, that's what continuous improvement is all about!

**APPA Strategic Assessment Model (SAM)** — **1995/96 Fiscal Year**

| Levels of Organizational Effectiveness | Financial Perspective | | Internal Process | | Innovation And Learning | | Customer Satisfaction | |
|---|---|---|---|---|---|---|---|---|
| 5 (Stretch Goals) | Facility Operating $/CRV | => 5.5% | Strategy | Level 5 | Tmg $ Invested | =>3.0% | % Svcs Measured | 95% - 100% |
| | Plant Renewal $/CRV | => 4.0% | PM Backlog | | Tmg Hrs Invested | =>3.0% | % Stakeholder Measured | 95% - 100% |
| | Plant Adaptation $/CRV | => 3.0% | Safety | =<0.4% | Training Mandated | =<0.03% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | =< 0.25% | Attendance | =<1.5% | CQI | Level 5 | | |
| | Def. Maint. Expend. $/CRV | => 3.0% | Energy Consumption | =<25,000 | | | | |
| | Facility Operating $/GIE | =>12.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 4 (Current Best Practice) | Facility Operating $/CRV | 5.0% - <5.5% | Strategy | Level 4 | Tmg $ Invested | 2.6% - <3.0% | % Svcs Measured | 90% - <95% |
| | Plant Renewal $/CRV | 3.0% - <4.0% | PM Backlog | | Tmg Hrs Invested | 2.0% - <3.0% | % Stakeholder Measured | 90% - <95% |
| | Plant Adaptation $/CRV | 2.0% - <3.0% | Safety | 0.6% - >4.0% | Training Mandated | 0.04% - >0.03% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | 0.85% - >0.25% | Attendance | 2.2% - >1.5% | CQI | Level 4 | | |
| | Def. Maint. Expend. $/CRV | 2.25% - <3.0% | Energy Consumption | 50,000 - >25,000 | | | | |
| | Facility Operating $/GIE | 11.5% - <12.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 3 | Facility Operating $/CRV | 4.5% - <5.0% | Strategy | Level 3 | Tmg $ Invested | 2.2% - <2.6% | % Svcs Measured | 85% - <90% |
| | Plant Renewal $/CRV | 2.0% - <3.0% | PM Backlog | | Tmg Hrs Invested | 1.5% - <2.0% | % Stakeholder Measured | 85% - <90% |
| | Plant Adaptation $/CRV | 1.0% - <2.0% | Safety | 0.8% - >0.6% | Training Mandated | 0.05% - >0.04% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | 1.15% - >0.85% | Attendance | 2.4% - >2.2% | CQI | Level 3 | | |
| | Def. Maint. Expend. $/CRV | 1.5% - <2.25% | Energy Consumption | 65,000 - >50,000 | | | | |
| | Facility Operating $/GIE | 10.5% - <11.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 2 | Facility Operating $/CRV | 4.0% - <4.5% | Strategy | Level 2 | Tmg $ Invested | 1.8% - <2.2% | % Svcs Measured | 80% - <85% |
| | Plant Renewal $/CRV, | 1.25% - <2.0% | PM Backlog | | Tmg Hrs Invested | 1.3% - <1.5% | % Stakeholder Measured | 75% - <85% |
| | Plant Adaptation $/CRV | 0.7% - <1.0% | Safety | 0.1% - >0.8% | Training Mandated | 0.07% - >0.05% | Employee Satisfaction | Yes |
| | Def. Maint. Backlog $/CRV | 1.95% - >1.15% | Attendance | 2.6% - >2.4% | CQI | Level 2 | | |
| | Def. Maint. Expend. $/CRV | 0.75% - <1.5% | Energy Consumption | 80,000 - >65,000 | | | | |
| | Facility Operating $/GIE | 9.5% - <10.5% | | | | | | |
| | Recharge for Services | Yes | | | | | | |
| 1 (80% of Orgs are Performing at This level) | Facility Operating $/CRV | <4.0% | Strategy | Level 1 | Tmg $ Invested | <1.8% | % Svcs Measured | <80% |
| | Plant Renewal $/CRV | <1.25% | PM Backlog | | Tmg Hrs Invested | <1.3% | % Stakeholder Measured | <75% |
| | Plant Adaptation $/CRV | <0.7% | Safety | >0.10% | Training Mandated | >0.07% | Employee Satisfaction | No |
| | Def. Maint. Backlog $/CRV | >1.95% | Attendance | >2.6% | CQI | Level 1 | | |
| | Def. Maint. Expend. $/CRV | <0.75% | Energy Consumption | >80,000 | | | | |
| | Facility Operating $/GIE | <9.5% | | | | | | |
| | Recharge for Services | No | | | | | | |

Figure 23. The SAM Matrix





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## Annual Facility Operating Expenditures as Percentage of Current Replacement Value (CRV)

**Annual Facility Operating Expenditures** includes all expenditures established to provide service and routine maintenance related to facilities and grounds used for educational and general purposes. It also includes expenditures for utilities (whether purchased or produced/generated locally), distribution systems, fire protection, infrastructure, roof maintenance, refuse disposal, structural systems maintenance, property insurance, and similar items. This category does not include expenditures made from institutional plant fund accounts nor does it include expenditures for institutional support services such as mail, telecommunications, public safety, security, motor pool, parking, environmental health and safety, central receiving, etc.

**CRV** is defined as the estimated cost in current dollars to replace the institution's educational and general facilities (excluding auxiliary facilities). It should include the full replacement cost for all buildings, grounds, utility systems, and generating plants. It is suggested that the average total project cost per square foot, multiplied by the gross square footage of educational and general buildings be used for the building portion of CRV. The costs to replace grounds, utilities, and generating plant should also be included to the extent they support general and educational facilities. This will likely require an apportionment of total replacement cost for these components that is consistent with the educational and general facilities they service and should exclude the auxiliary portion.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 93 | 12 | 9 | 25 | 18 | 20 | 9 |
| Avg | 3.14% | 3.24% | 2.65% | 3.36% | 3.51% | 3.00% | 2.46% |
| Mean | 2.96% | 3.21% | 2.36% | 3.07% | 3.43% | 2.76% | 2.35% |
| 80%tile | 4.01% | 3.70% | 3.29% | 4.67% | 4.38% | 3.54% | 3.04% |
| Min | 0.23% | 2.31% | 1.32% | 0.23% | 1.17% | 1.13% | 1.66% |
| Max | 8.28% | 4.64% | 4.82% | 6.40% | 5.34% | 8.28% | 3.62% |
| Std Dev | 1.30% | 0.73% | 1.05% | 1.37% | 1.09% | 1.60% | 0.71% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 22 | 5 | 3 | 9 | 30 | 12 | 12 |
| Avg | 3.17% | 3.26% | 2.10% | 3.01% | 2.95% | 2.93% | 4.07% |
| Mean | 2.98% | 3.01% | 2.26% | 2.57% | 2.85% | 2.74% | 3.33% |
| 80%tile | 4.31% | 4.68% | 2.38% | 3.51% | 3.50% | 4.29% | 5.30% |
| Min | 0.23% | 1.13% | 1.58% | 1.59% | 1.24% | 1.17% | 2.11% |
| Max | 5.34% | 4.82% | 2.47% | 6.23% | 6.28% | 4.87% | 8.28% |
| Std Dev | 1.23% | 1.52% | 0.47% | 1.41% | 0.93% | 1.39% | 1.83% |

### BENCHMARK PERSPECTIVE—Financial

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | <4.0% (80% of organizations operate at this level) |
| Level 2 | 4.0% - <4.5%; |
| Level 3 | 4.5% - <5.0%; |
| Level 4 | 5.0% - <5.5% (Current Best Practices) |
| Level 5 | =>5.5% (Stretch Goals) |

## Deferred Maintenance Backlog (in dollars) as Percentage of Current Replacement Value (CRV)

**The Deferred Maintenance Backlog** consists of maintenance projects that were not included in the operating or plant renewal budgeting processes because of a perceived lower priority status than those funded with available resources. Deferred maintenance exists as a result of many years of inadequate Annual Facilities Operating Expenditures and Plant Renewal Expenditures. This data set is typically based on a facilities condition inventory of facilities audit, and includes the entire dollar value of the institution's past-due Deferred Maintenance liability.

**CRV** is defined as the estimated cost in current dollars to replace the institution's educational and general facilities (excluding auxiliary facilities). It should include the full replacement cost for all buildings, grounds, utility systems, and generating plants. It is suggested that the average total project cost per square foot, multiplied by the gross square footage of educational and general buildings be used for the building portion of CRV. The costs to replace grounds, utilities, and generating plant should also be included to the extent they support general and educational facilities. This will likely require an apportionment of total replacement cost for these components that is consistent with the educational and general facilities they service and should exclude the auxiliary portion.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 88 | 10 | 8 | 25 | 18 | 19 | 8 |
| Avg | 7.58% | 3.70% | 8.33% | 9.12% | 8.90% | 5.68% | 8.41% |
| Mean | 5.43% | 2.18% | 8.81% | 8.00% | 6.96% | 5.26% | 8.58% |
| 80%tile | 1.97% | 0.94% | 2.64% | 4.18% | 1.82% | 1.48% | 3.68% |
| Min | 0.07% | 0.35% | 1.16% | 0.16% | 0.08% | 0.07% | 1.79% |
| Max | 30.05% | 12.04% | 17.31% | 24.50% | 30.05% | 15.39% | 18.18% |
| Std Dev | 6.24% | 3.78% | 5.87% | 6.50% | 8.12% | 4.31% | 5.35% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 22 | 5 | 3 | 9 | 27 | 12 | 10 |
| Avg | 7.85% | 7.05% | 9.91% | 8.10% | 10.01% | 3.59% | 4.29% |
| Mean | 8.06% | 5.30% | 5.04% | 5.00% | 9.43% | 2.61% | 4.06% |
| 80%tile | 3.26% | 4.43% | 4.68% | 1.93% | 4.68% | 0.67% | 0.94% |
| Min | 0.08% | 1.08% | 4.43% | 1.21% | 1.44% | 0.22% | 0.07% |
| Max | 20.48% | 14.95% | 20.27% | 30.05% | 24.50% | 12.07% | 11.87% |
| Std Dev | 5.82% | 5.17% | 8.97% | 9.06% | 6.14% | 3.79% | 3.91% |

### BENCHMARK PERSPECTIVE—Financial

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | >1.95% (80% of organizations operate at this level) |
| Level 2 | 1.95% - >1.15%; |
| Level 3 | 1.15% - >.85%; |
| Level 4 | .85% - >.25% (Current Best Practices) |
| Level 5 | =<.25% (Stretch Goals) |

## Annual Plant Renewal Expenditures as Percentage of Current Replacement Value (CRV)

**Annual Facility Renewal Expenditures** includes all expenditures required to keep the physical plant in reliable operating condition for its present use. These expenditures are over and above normal maintenance for items with a life cycle in excess of one year and are not normally contained in an annual operating budget (i.e., Annual Facility Operating Expenditures). This is a separately funded, uniquely identified program that renews, replaces, or renovates building systems on a schedule based on life cycle recommendations and on assessment of expected remaining useful life. This is typically represented as a portion of the plant fund expenditures for an institution. Plant renewal focuses on maintaining the operability, suitability, and value of capital assets. It is accomplished through the replacement and rework of those components of a building that wear out even though those components are routinely maintained. Plant renewal is a time-driven process with specific useful life cycles for heating and ventilation systems, etc. This often is provided in the form of capital funding for "major maintenance" before it becomes "deferred."

**CRV** is defined as the estimated cost in current dollars to replace the institution's educational and general facilities (excluding auxiliary facilities). It should include the full replacement cost for all buildings, grounds, utility systems, and generating plants.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 81 | 11 | 6 | 22 | 17 | 18 | 7 |
| Avg | 0.84% | 1.48% | 0.63% | 0.63% | 0.94% | 0.90% | 0.32% |
| Mean | 0.34% | 0.81% | 0.27% | 0.29% | 0.41% | 0.38% | 0.17% |
| 80%tile | 1.15% | 2.76% | 0.69% | 0.96% | 1.14% | 0.96% | 0.44% |
| Min | 0.01% | 0.07% | 0.17% | 0.01% | 0.10% | 0.02% | 0.07% |
| Max | 5.85% | 4.95% | 2.20% | 3.95% | 5.25% | 5.85% | 1.10% |
| Std Dev | 1.20% | 1.53% | 0.79% | 1.23% | 1.34% | 1.43% | 0.37% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 21 | 4 | 3 | 6 | 26 | 12 | 9 |
| Avg | 0.85% | 1.98% | 0.21% | 0.24% | 0.81% | 0.76% | 1.14% |
| Mean | 0.37% | 1.37% | 0.20% | 0.20% | 0.32% | 0.45% | 0.56% |
| 80%tile | 1.29% | 2.99% | 0.26% | 0.27% | 1.03% | 0.76% | 1.18% |
| Min | 0.05% | 0.22% | 0.12% | 0.13% | 0.02% | 0.08% | 0.01% |
| Max | 5.25% | 4.95% | 0.30% | 0.50% | 3.95% | 2.76% | 5.85% |
| Std Dev | 1.18% | 2.07% | 0.09% | 0.14% | 1.06% | 0.94% | 1.82% |

### BENCHMARK PERSPECTIVE—Financial

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | <1.25% (80% of organizations operate at this level) |
| Level 2 | 1.25% - <2.0% |
| Level 3 | 2.0% - <3.0% |
| Level 4 | 3.0% - <4.0% (Current Best Practices) |
| Level 5 | =>4.0% (Stretch Goals) |

## Annual Plant Adaptation Expenditures as Percentage of Current Replacement Value (CRV)

**Annual Plant Adaptation Expenditures** are expenditures required to meet the evolving physical needs of an institution and to meet compliance mandates. These expenditures are in addition to normal maintenance and are not usually contained within the operating budget. These are also typically represented as a portion of plant fund expenditures. Examples of Plant Adaptation Expenditures include such items as Americans with Disabilities Act (ADA) projects, asbestos removal, code compliance, and changes in classroom, research, and laboratory to accommodate current technology or programmatic needs. Adaptation is typically accomplished through renovation, alterations, and other improvements outside of the normal maintenance cycle. CRV is defined as the estimated cost in current dollars to replace the institution's educational and general facilities (excluding auxiliary facilities). It should include the full replacement cost for all buildings, grounds, utility systems, and generating plants.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 80 | 10 | 7 | 20 | 17 | 19 | 7 |
| Avg | 0.52% | 0.38% | 0.76% | 0.57% | 0.60% | 0.46% | 0.29% |
| Mean | 0.22% | 0.12% | 0.31% | 0.34% | 0.16% | 0.22% | 0.17% |
| 80%tile | 0.66% | 0.31% | 0.62% | 0.69% | 0.63% | 0.74% | 0.36% |
| Min | 0.00% | 0.00% | 0.05% | 0.01% | 0.01% | 0.02% | 0.09% |
| Max | 4.17% | 2.57% | 3.52% | 2.86% | 4.17% | 2.09% | 0.88% |
| Std Dev | 0.80% | 0.78% | 1.23% | 0.74% | 1.11% | 0.55% | 0.28% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 21 | 3 | 3 | 7 | 26 | 11 | 9 |
| Avg | 0.43% | 0.34% | 0.15% | 0.26% | 0.70% | 0.54% | 0.54% |
| Mean | 0.37% | 0.37% | 0.10% | 0.13% | 0.25% | 0.19% | 0.39% |
| 80%tile | 0.67% | 0.53% | 0.19% | 0.40% | 1.16% | 0.25% | 0.66% |
| Min | 0.01% | 0.01% | 0.10% | 0.02% | 0.00% | 0.06% | 0.03% |
| Max | 1.67% | 0.64% | 0.24% | 0.88% | 3.52% | 4.17% | 2.09% |
| Std Dev | 0.43% | 0.32% | 0.08% | 0.31% | 1.02% | 1.20% | 0.64% |

### BENCHMARK PERSPECTIVE—Financial

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | <0.7% (80% of organizations operate at this level) |
| | Level 2 0.7% - <1.0% |
| Level 3 | 1.0% - <2.0% |
| Level 4 | 2.0% - <3.0% (Current Best Practices) |
| Level 5 | =>3.0% (Stretch Goals) |

## Annual Deferred Maintenance Expenditures as a Percentage of Current Replacement Value (CRV)

**The Annual Deferred Maintenance Expenditures** are defined as all actual expenditures during the fiscal year of the survey (including fiscal year-end partial payments) incurred on projects that are part of the institution's Deferred Maintenance Backlog. Typically, this is considered "catch-up" maintenance and is expended in the institution's plant fund expenditure category. **The Deferred Maintenance Backlog** consists of maintenance projects that were not included in the operating or plant renewal budgeting processes because of a perceived lower priority status than those funded with available resources. Deferred maintenance exists as a result of many years of inadequate Annual Facilities Operating Expenditures and Plant Renewal Expenditures. This data set is typically based on a facilities condition inventory of facilities audit, and includes the entire dollar value of the institution's past-due Deferred Maintenance liability.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 78 | 11 | 8 | 23 | 16 | 13 | 7 |
| Avg | 1.04% | 1.45% | 0.56% | 1.19% | 1.20% | 0.92% | 0.28% |
| Mean | 0.34% | 0.17% | 0.22% | 0.33% | 0.35% | 0.58% | 0.24% |
| 80%tile | 0.75% | 0.47% | 1.18% | 2.09% | 0.66% | 0.86% | 0.39% |
| Min | 0.01% | 0.01% | 0.04% | 0.01% | 0.06% | 0.06% | 0.12% |
| Max | 14.00% | 13.47% | 1.50% | 6.21% | 14.00% | 4.96% | 0.50% |
| Std Dev | 2.38% | 3.99% | 0.61% | 2.74% | 3.42% | 1.28% | 0.14% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 20 | 4 | 3 | 8 | 22 | 11 | 10 |
| Avg | 0.80% | 0.54% | 0.13% | 0.84% | 0.48% | 0.66% | 3.81% |
| Mean | 0.33% | 0.21% | 0.12% | 0.41% | 0.35% | 0.15% | 0.74% |
| 80%tile | 0.73% | 0.85% | 0.16% | 1.39% | 0.65% | 0.39% | 7.43% |
| Min | 0.01% | 0.07% | 0.10% | 0.12% | 0.02% | 0.01% | 0.07% |
| Max | 6.21% | 1.69% | 0.18% | 2.94% | 2.19% | 4.96% | 14.00% |
| Std Dev | 1.42% | 0.77% | 0.04% | 1.04% | 0.50% | 1.44% | 5.50% |

### BENCHMARK PERSPECTIVE—Financial

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | <0.75% (80% of organizations operate at this level) |
| Level 2 | 0.75% - <1.50% |
| Level 3 | 1.50% - <2.25% |
| Level 4 | 2.25% - <3.00% (Current Best Practices) |
| Level 5 | =>3.00% (Stretch Goals) |

## Annual Facility Operating Expenditures as a Percentage of Gross Institutional Expenditures (GIE)

**Annual Facility Operating Expenditures** includes all expenditures established to provide service and routine maintenance related to facilities and grounds used for educational and general purposes. It also includes expenditures for utilities (whether purchased or produced/generated locally), distribution systems, fire protection, infrastructure, roof maintenance, refuse disposal, structural systems maintenance, property insurance, and similar items. This category does not include expenditures for institutional support services such as mail, telecommunications, public safety, security, motor pool, parking, environmental health and safety, central receiving, etc. **Gross Institutional Expenditures** is defined as the institution's total expenditures for educational and general purposes and excludes expenditures for all auxiliary functions.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 89 | 12 | 8 | 25 | 17 | 19 | 8 |
| Avg | 7.48% | 8.05% | 7.56% | 8.16% | 7.00% | 7.22% | 6.10% |
| Mean | 7.27% | 7.23% | 7.79% | 7.77% | 6.08% | 7.56% | 6.02% |
| 80%tile | 9.58% | 8.22% | 10.48% | 10.17% | 9.03% | 9.16% | 7.12% |
| Min | 0.78% | 5.55% | 3.51% | 0.78% | 2.69% | 2.87% | 4.40% |
| Max | 17.13% | 15.87% | 11.73% | 17.13% | 12.78% | 11.58% | 7.90% |
| Std Dev | 2.79% | 2.73% | 3.22% | 3.16% | 2.65% | 2.52% | 1.21% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 22 | 5 | 3 | 8 | 30 | 11 | 10 |
| Avg | 8.04% | 6.32% | 7.69% | 9.04% | 6.64% | 7.35% | 8.19% |
| Mean | 8.14% | 6.30% | 7.24% | 8.33% | 6.36% | 7.45% | 8.96% |
| 80%tile | 10.12% | 7.54% | 8.39% | 11.01% | 8.00% | 8.84% | 9.98% |
| Min | 0.78% | 2.87% | 6.68% | 3.57% | 3.51% | 2.69% | 5.06% |
| Max | 12.78% | 11.73% | 9.16% | 17.13% | 15.87% | 11.86% | 10.47% |
| Std Dev | 2.86% | 3.37% | 1.30% | 4.15% | 2.44% | 2.76% | 2.04% |

### BENCHMARK PERSPECTIVE—Financial

APPA 1996 PERFORMANCE STANDARD

- Level 1 <9.5 % (80% of organizations operate at this level)
- Level 2 9.5% - <10.5%
- Level 3 10.5% - <11.5%
- Level 4 11.5% - <12.5% (Current Best Practices)
- Level 5 =>12.5% (Stretch Goals)

## Percent Recharging for Services with Fully Loaded Recharge Rates

**Recharge for Services** represents the support or indirect costs that enable a shop to deliver service to a customer. This question simply asks if your recharge rate is fully loaded. It is derived by taking the actual trade specific hourly labor rates and loading all identifiable support and indirect costs. This includes an apportionment of support costs for such items as administrative and supervisory activities. It also includes overhead costs such as non-productive/non-billable time of trades personnel (i.e., breaks, meetings, etc.), fringe benefits, vehicle purchases and operating costs, small tool purchases, uniform purchases and cleaning, training, etc.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 83 | 11 | 7 | 19 | 18 | 17 | 11 |
| YES | 42% | 64% | 86% | 32% | 39% | 34% | 45% |
| NO | 58% | 36% | 14% | 68% | 61% | 76% | 55% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 21 | 3 | 3 | 7 | 30 | 12 | 7 |
| YES | 38% | 67% | 67% | 29% | 53% | 33% | 14% |
| NO | 62% | 33% | 33% | 71% | 47% | 67% | 86% |

### BENCHMARK PERSPECTIVE—Financial

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | No (80% of organizations operate at this level) |
| Level 2 | Yes |
| Level 3 | Yes |
| Level 4 | Yes (Current Best Practices) |
| Level 5 | Yes (Stretch Goals) |

## Average Strategic Level of Facilities Operations

**Strategy** is the degree to which leadership and planning are integrated and actively applied by the Facilities Organization in its support of the institution's mission and goals. Please reference the five performance standard levels shown below. The chart reflects the average of the levels reported by participating campuses. See the Strategy Report Table for the strategic level of operations in individual campuses.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 67 | 7 | 7 | 16 | 13 | 18 | 6 |
| Level 1 | 22% | 43% | 14% | 19% | 31% | 22% | 0% |
| Level 2 | 6% | 0% | 0% | 19% | 8% | 0% | 0% |
| Level 3 | 27% | 57% | 29% | 31% | 23% | 17% | 17% |
| Level 4 | 17% | 0% | 14% | 19% | 0% | 28% | 33% |
| Level 5 | 28% | 0% | 43% | 12% | 38% | 33% | 50% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 13 | 3 | 2 | 8 | 22 | 7 | 12 |
| Level 1 | 23% | 0% | 0% | 12% | 27% | 14% | 34% |
| Level 2 | 0% | 0% | 50% | 13% | 5% | 0% | 8% |
| Level 3 | 15% | 67% | 0% | 50% | 18% | 43% | 25% |
| Level 4 | 23% | 0% | 50% | 12% | 23% | 0% | 8% |
| Level 5 | 39% | 33% | 0% | 13% | 27% | 43% | 25% |

### BENCHMARK PERSPECTIVE—Internal Process

**APPA 1996 PERFORMANCE STANDARD**

- Level 1 Mission Statement in Place
- Level 2 Strategic Plan with Mission & Vision on the Shelf
- Level 3 Strategic Plan with Mission & Vision Effectively Communicated
- Level 4 Strategic Plan supported by Annual Operating Goals
- Level 5 Integrated Planning and Budgeting

## Safety—Hours Missed Due to Work Related Injuries as Percentage of Total Hours Worked

**Total Hours Worked** for the Facilities Department includes overtime.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 55 | 8 | 5 | 16 | 9 | 12 | 5 |
| Avg | 0.84% | 1.34% | 0.84% | 1.23% | 0.30% | 0.67% | 0.18% |
| Mean | 0.34% | 0.93% | 0.94% | 0.59% | 0.13% | 0.30% | 0.06% |
| 80%tile | 0.11% | 0.10% | 0.56% | 0.25% | 0.03% | 0.13% | 0.05% |
| Min | 0.01% | 0.01% | 0.25% | 0.09% | 0.01% | 0.04% | 0.01% |
| Max | 6.15% | 6.15% | 1.23% | 4.03% | 1.50% | 2.73% | 0.62% |
| Std Dev | 1.18% | 2.01% | 0.40% | 1.18% | 0.48% | 0.87% | 0.25% |
| | **Comp** | **Medical** | **Internat** | **Lib Arts** | **Research** | **Doctorate** | **2 Year** |
| Count | 13 | 2 | 1 | 6 | 20 | 7 | 6 |
| Avg | 1.76% | 0.68% | 0.09% | 0.28% | 0.77% | 0.26% | 0.52% |
| Mean | 0.62% | 0.68% | 0.09% | 0.16% | 0.51% | 0.12% | 0.45% |
| 80%tile | 0.25% | 0.40% | 0.09% | 0.04% | 0.13% | 0.03% | 0.14% |
| Min | 0.03% | 0.21% | 0.09% | 0.03% | 0.01% | 0.01% | 0.12% |
| Max | 6.15% | 1.15% | 0.09% | 1.02% | 2.73% | 0.79% | 1.23% |
| Std Dev | 1.94% | 0.67% | N/A | 0.38% | 0.78% | 0.32% | 0.42% |

### BENCHMARK PERSPECTIVE—Internal Process

**APPA 1996 PERFORMANCE STANDARD**

- Level 1 >0.10% (80% of organizations operate at this level)
- Level 2 0.10% - >0.08%
- Level 3 0.08% - >0.06%)
- Level 4 0.06% - >0.04% (Current Best Practices)
- Level 5 =<0.04% (Stretch Goals)

## Attendance—Hours of Sick Leave Taken as Percentage of Total Hours Worked

**Sick Leave Taken** includes both paid and unpaid sick leave. **Total Hours Worked** exclude vacation, holiday, and personal leave.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 58 | 8 | 5 | 16 | 12 | 13 | 4 |
| Avg | 4.18% | 3.34% | 4.29% | 4.61% | 4.79% | 3.84% | 3.25% |
| Mean | 3.98% | 3.18% | 3.83% | 4.20% | 3.99% | 4.00% | 3.89% |
| 80%tile | 2.67% | 2.36% | 3.55% | 2.63% | 3.02% | 2.86% | 2.37% |
| Min | 0.17% | 1.43% | 3.42% | 1.86% | 0.17% | 0.93% | 0.31% |
| Max | 14.73% | 5.42% | 6.56% | 14.73% | 11.00% | 6.55% | 4.93% |
| Std Dev | 2.34% | 1.34% | 1.29% | 2.73% | 3.09% | 1.44% | 2.03% |
| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
| Count | 14 | 1 | 1 | 6 | 20 | 8 | 8 |
| Avg | 4.00% | 2.31% | 5.79% | 2.70% | 4.19% | 5.17% | 4.61% |
| Mean | 3.77% | 2.31% | 5.79% | 2.21% | 3.90% | 4.10% | 4.26% |
| 80%tile | 2.76% | 2.31% | 5.79% | 0.93% | 3.55% | 3.21% | 2.68% |
| Min | 2.59% | 2.31% | 5.79% | 0.31% | 2.44% | 0.17% | 1.43% |
| Max | 11.00% | 2.31% | 5.79% | 5.85% | 6.55% | 14.73% | 10.47% |
| Std Dev | 2.13% | N/A | N/A | 2.17% | 1.00% | 4.28% | 2.76% |

### BENCHMARK PERSPECTIVE—Internal Process

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | >2.6% (80% of organizations operate at this level) |
| Level 2 | 2.6% - >2.4% |
| Level 3 | 2.4% - >2.2% |
| Level 4 | 2.2% - >1.5% (Current Best Practices) |
| Level 5 | =<1.5% (Stretch Goals) |

## BTU Consumption Per Gross Square Footage

**Energy Consumption** is all institutional energy consumption, calculated in British thermal units (BTU).

**Gross Square Footage** served by the BTUs listed in Energy Consumption.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 65 | 8 | 8 | 17 | 12 | 14 | 6 |
| Avg | 149,530 | 179,981 | 111,588 | 127,756 | 150,348 | 186,192 | 134,027 |
| Mean | 145,109 | 195,245 | 130,489 | 135,842 | 136,239 | 193,252 | 121,635 |
| 80%tile | 86,307 | 144,830 | 37,590 | 77,323 | 93,219 | 112,264 | 104,728 |
| Min | 10,281 | 50,744 | 25,503 | 14,249 | 81,933 | 10,281 | 30,396 |
| Max | 341,426 | 282,028 | 225,158 | 210,784 | 327,090 | 341,426 | 283,944 |
| Std Dev | 77,561 | 68,045 | 70,638 | 66,770 | 72,136 | 97,913 | 83,564 |
| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
| Count | 14 | 3 | 3 | 6 | 25 | 5 | 9 |
| Avg | 168,764 | 237,789 | 93,552 | 82,072 | 187,647 | 105,055 | 72,648 |
| Mean | 152,008 | 226,021 | 52,434 | 99,877 | 184,095 | 93,201 | 74,864 |
| 80%tile | 88,749 | 225,503 | 36,275 | 30,396 | 147,907 | 79,285 | 40,868 |
| Min | 76,708 | 225,158 | 25,503 | 10,281 | 104,728 | 46,821 | 14,249 |
| Max | 341,426 | 262,187 | 202,719 | 135,842 | 305,791 | 152,987 | 116,028 |
| Std Dev | 90,423 | 21,134 | 95,496 | 50,038 | 51,290 | 43,948 | 37,976 |

### BENCHMARK PERSPECTIVE —Internal Process

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | >80,000 (80% of organizations operate at this level) |
| Level 2 | 80,000 - >65,000 |
| Level 3 | 65,000 - >50,000 |
| Level 4 | 50,000 - >25,000 (Current Best Practices) |
| Level 5 | =<25,000 (Stretch Goals) |

## Training Investment as Percent of Total Personnel Compensation in the Facilities Organization

**Training Investment** is the total cost of training, with fringe benefits included. This includes all travel-related expenditures (such as meals, lodging, registration fees, etc.), the salary cost of the employee receiving the training while away from the job, and the salary and/or operational cost of in-house or campus-wide training personnel. Typical on-the-job training (i.e., apprenticeship programs) would not be included. However, time spent in specific or designated training activities (on-site vendor training, supervisory skills, new product or service orientation, professional conferences and seminars, regulatory compliance, etc.) would be included here. **Total Personnel Compensation in the Facilities Organization** is the department's annual payroll expense, including fringe benefits and overtime. Contract employee payroll expense is excluded unless the facilities organization funds training of contract employees as a facilities' training expense.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 51 | 8 | 5 | 10 | 13 | 7 | 8 |
| Avg | 1.21% | 1.11% | 1.06% | 1.32% | 1.22% | 1.14% | 1.32% |
| Mean | 1.14% | 0.81% | 1.19% | 1.12% | 1.14% | 1.11% | 1.21% |
| 80%tile | 1.82% | 1.62% | 1.25% | 2.04% | 1.81% | 1.78% | 1.63% |
| Min | 0.11% | 0.47% | 0.49% | 0.34% | 0.15% | 0.11% | 0.12% |
| Max | 3.36% | 2.63% | 1.48% | 2.90% | 2.89% | 2.33% | 3.36% |
| Std Dev | 0.79% | 0.77% | 0.37% | 0.85% | 0.81% | 0.82% | 0.98% |
| | **Comp** | **Medical** | **Internat** | **Lib Arts** | **Research** | **Doctorate** | **2 Year** |
| Count | 12 | 4 | 1 | 5 | 13 | 9 | 7 |
| Avg | 1.10% | 0.91% | 1.63% | 1.39% | 1.31% | 1.03% | 1.44% |
| Mean | 1.15% | 0.93% | 1.63% | 1.14% | 1.12% | 1.08% | 1.20% |
| 80%tile | 1.44% | 1.05% | 1.63% | 2.04% | 2.15% | 1.29% | 1.87% |
| Min | 0.11% | 0.58% | 1.63% | 0.46% | 0.15% | 0.47% | 0.33% |
| Max | 2.89% | 1.19% | 1.63% | 2.71% | 3.36% | 2.19% | 2.90% |
| Std Dev | 0.77% | 0.25% | N/A | 0.91% | 1.02% | 0.56% | 0.84% |

### BENCHMARK PERSPECTIVE—Innovation and Learning

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | <1.8% (80% of organizations operate at this level) |
| Level 2 | 1.8% - <2.2% |
| Level 3 | 2.2% - <2.6% |
| Level 4 | 2.6% - <3.0% (Current Best Practices) |
| Level 5 | =>3.0% (Stretch Goals) |

## Training Hours as Percent of Total Hours Worked (excluding leave)

**Training Hours** includes travel time while on salary for training activities. Time spent on typical on-the-job training (i.e., apprenticeship programs) would not be included. However, time spent in specific or designated training activities (on-site vendor training, supervisory skills, new product or service orientation, professional conferences and seminars, regulatory compliance, etc.) would be included.

**Total Hours Worked** exclude vacation, holiday, and personal leave.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 51 | 6 | 5 | 14 | 10 | 11 | 5 |
| Avg | 0.77% | 0.68% | 0.66% | 0.85% | 0.40% | 1.03% | 0.99% |
| Mean | 0.55% | 0.58% | 0.40% | 0.59% | 0.30% | 0.93% | 0.65% |
| 80%tile | 1.27% | 1.17% | 0.84% | 1.23% | 0.57% | 1.44% | 1.69% |
| Min | 0.01% | 0.07% | 0.12% | 0.26% | 0.01% | 0.08% | 0.22% |
| Max | 3.32% | 1.44% | 2.05% | 2.50% | 1.40% | 3.32% | 2.30% |
| Std Dev | 0.71% | 0.57% | 0.80% | 0.63% | 0.41% | 0.93% | 0.90% |
| | **Comp** | **Medical** | **Internat** | **Lib Arts** | **Research** | **Doctorate** | **2 Year** |
| Count | 12 | 2 | 1 | 4 | 18 | 6 | 8 |
| Avg | 0.46% | 0.17% | 0.60% | 0.86% | 1.02% | 0.61% | 0.94% |
| Mean | 0.36% | 0.17% | 0.60% | 0.90% | 0.88% | 0.49% | 0.44% |
| 80%tile | 0.60% | 0.23% | 0.60% | 1.42% | 1.37% | 0.65% | 1.53% |
| Min | 0.01% | 0.07% | 0.60% | 0.22% | 0.22% | 0.16% | 0.06% |
| Max | 1.54% | 0.27% | 0.60% | 1.44% | 2.50% | 1.73% | 3.32% |
| Std Dev | 0.43% | 0.14% | N/A | 0.65% | 0.69% | 0.58% | 1.12% |

### BENCHMARK PERSPECTIVE—Innovation and Learning

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | <1.3% (80% of organizations operate at this level) |
| Level 2 | 1.3 <1.5% |
| Level 3 | 1.5% - <2.0% |
| Level 4 | 2.0% - <3.0% (Current Best Practices) |
| Level 5 | =>3.0% (Stretch Goals) |

## Total Hours of Mandated Training as a Percentage of Total Hours Worked

**Total Hours of Mandated Training** is that training mandated by local, state, or federal regulations.

**Total Hours Worked** pertains to the total facilities operations annual work hours including overtime.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 48 | 6 | 5 | 13 | 10 | 11 | 4 |
| Avg | 0.44% | 0.69% | 0.20% | 0.47% | 0.46% | 0.47% | 0.18% |
| Mean | 0.21% | 0.29% | 0.03% | 0.19% | 0.16% | 0.27% | 0.19% |
| 80%tile | 0.07% | 0.09% | 0.03% | 0.08% | 0.03% | 0.12% | 0.15% |
| Min | 0.01% | 0.07% | 0.01% | 0.06% | 0.01% | 0.04% | 0.11% |
| Max | 2.50% | 1.99% | 0.58% | 2.50% | 2.12% | 2.00% | 0.21% |
| Std Dev | 0.62% | 0.81% | 0.25% | 0.75% | 0.72% | 0.56% | 0.05% |
| | **Comp** | **Medical** | **Internat** | **Lib Arts** | **Research** | **Doctorate** | **2 Year** |
| Count | 9 | 2 | 1 | 3 | 19 | 7 | 8 |
| Avg | 0.32% | 0.17% | 0.22% | 0.74% | 0.45% | 0.51% | 0.49% |
| Mean | 0.08% | 0.17% | 0.22% | 0.72% | 0.21% | 0.24% | 0.14% |
| 80%tile | 0.04% | 0.11% | 0.22% | 0.34% | 0.12% | 0.09% | 0.04% |
| Min | 0.03% | 0.07% | 0.22% | 0.09% | 0.01% | 0.03% | 0.01% |
| Max | 2.12% | 0.27% | 0.22% | 1.40% | 2.50% | 1.99% | 2.00% |
| Std Dev | 0.68% | 0.14% | N/A | 0.65% | 0.60% | 0.69% | 0.73% |

### BENCHMARK PERSPECTIVE—Innovation and Learning

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | >0.07% (80% of organizations operate at this level) |
| Level 2 | 0.07% - >0.05% |
| Level 3 | 0.05% - >0.04% |
| Level 4 | 0.04% - >0.03% (Current Best Practices) |
| Level 5 | =<0.03% (Stretch Goals) |

## Continuous Quality Improvement (CQI) Level of Facilities Operations

**Continuous Quality Improvement** levels define the extent to which the facilities department has implemented a total and continuous quality improvement process. Please reference the five performance standard levels shown below. The enclosed chart reflects the average of the levels reported by participating campuses.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 68 | 1 | 1 | 1 | 1 | 1 | 1 |
| Level 1 | 47% | 70% | 29% | 53% | 54% | 29% | 40% |
| Level 2 | 16% | 10% | 14% | 26% | 15% | 14% | 0% |
| Level 3 | 22% | 10% | 29% | 10% | 8% | 50% | 40% |
| Level 4 | 7% | 0% | 0% | 11% | 15% | 0% | 20% |
| Level 5 | 8% | 10% | 28% | 0% | 8% | 7% | 0% |

| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
|---|---|---|---|---|---|---|---|
| Count | 16 | 2 | 3 | 4 | 27 | 7 | 9 |
| Level 1 | 63% | 50% | 33% | 75% | 37% | 29% | 56% |
| Level 2 | 3% | 50% | 0% | 0% | 15% | 14% | 22% |
| Level 3 | 0% | 0% | 67% | 25% | 37% | 14% | 11% |
| Level 4 | 13% | 0% | 0% | 0% | 7% | 14% | 0% |
| Level 5 | 6% | 0% | 0% | 0% | 4% | 29% | 11% |

### BENCHMARK PERSPECTIVE—Innovation and Learning

**APPA 1996 PERFORMANCE STANDARD**

- Level 1 — Informal CQI Process started; no overall strategy developed
- Level 2 — Recent facilities department-wide effort to train & implement CQI
- Level 3 — Facilities department on its way to institutionalizing CQI process
- Level 4 — Complete implementation of CQI within facilities department
- Level 5 — Complete implementation of total and continuous CQI in facilities department linked to university-wide CQI process

## Percent Customer Services for which Customer Satisfaction is Measured on an Annual Basis

These services may include, for example, building heating, air conditioning, elevator lighting, safety, accessibility, and general aesthetics; custodial services; grounds and landscaping; remodeling and alteration services; moving and setup services; mail services; and transportation or fleet services.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 50 | 5 | 1 | 13 | 12 | 13 | 6 |
| Avg | 50% | 73% | 50% | 35% | 46% | 56% | 62% |
| Mean | 50% | 80% | 50% | 22% | 34% | 50% | 70% |
| 80%tile | 82% | 100% | 50% | 56% | 73% | 89% | 98% |
| Min | 3% | 10% | 50% | 5% | 5% | 10% | 3% |
| Max | 100% | 100% | 50% | 93% | 100% | 100% | 100% |
| Std Dev | 32% | 37% | N/A | 33% | 29% | 31% | 41% |
| | **Comp** | **Medical** | **Internat** | **Lib Arts** | **Research** | **Doctorate** | **2 Year** |
| Count | 14 | 1 | 2 | 4 | 20 | 5 | 4 |
| Avg | 44% | 80% | 35% | 63% | 49% | 61% | 54% |
| Mean | 40% | 80% | 35% | 64% | 50% | 45% | 53% |
| 80%tile | 70% | 80% | 44% | 99% | 76% | 100% | 85% |
| Min | 10% | 80% | 20% | 25% | 3% | 20% | 10% |
| Max | 100% | 80% | 50% | 100% | 95% | 100% | 100% |
| Std Dev | 32% | N/A | 21% | 41% | 31% | 37% | 41% |

### BENCHMARK PERSPECTIVE—Customer Satisfaction

**APPA 1996 PERFORMANCE STANDARD**

- Level 1 <80% (80% of organizations operate at this level)
- Level 2 80% - <85%
- Level 3 85% - <90%
- Level 4 90% - <95% (Current Best Practices)
- Level 5 95% - 100% (Stretch Goals)

## Percent of Stakeholder Groups Measured Annually for Customer Satisfaction

Stakeholder groups include trustees, the president, members of the administration, resource providers, faculty, students, parents, alumni, internal staff, and campus support groups, for example. Each facility needs to define its own group of stakeholders. This metric evaluates what percent of those stakeholders are questioned at least annually regarding their satisfaction with the facilities department.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 39 | 4 | 5 | 11 | 7 | 8 | 4 |
| Avg | 47% | 39% | 51% | 45% | 52% | 41% | 59% |
| Mean | 50% | 24% | 50% | 50% | 60% | 30% | 63% |
| 80%tile | 75% | 55% | 80% | 60% | 66% | 68% | 85% |
| Min | 5% | 10% | 10% | 10% | 5% | 10% | 10% |
| Max | 100% | 100% | 100% | 100% | 75% | 80% | 100% |
| Std Dev | 29% | 41% | 37% | 30% | 23% | 27% | 38% |
| | **Comp** | **Medical** | **Internat** | **Lib Arts** | **Research** | **Doctorate** | **2 Year** |
| Count | 9 | 1 | 2 | 1 | 15 | 6 | 5 |
| Avg | 45% | 80% | 48% | 10% | 51% | 39% | 48% |
| Mean | 50% | 80% | 48% | 10% | 50% | 30% | 50% |
| 80%tile | 63% | 80% | 64% | 10% | 76% | 50% | 68% |
| Min | 10% | 80% | 20% | 10% | 10% | 5% | 10% |
| Max | 80% | 80% | 75% | 10% | 100% | 100% | 100% |
| Std Dev | 25% | N/A | 39% | N/A | 30% | 33% | 36% |

### BENCHMARK PERSPECTIVE—Customer Satisfaction

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | <75% (80% of organizations operate at this level) |
| Level 2 | 75% - <85% |
| Level 3 | 85% - <90% (Current Best Practices) |
| Level 4 | 90% - <95% (Stretch Goals) |
| Level 5 | 95% - 100% |

## Percent Measuring Employee Satisfaction Regularly

This question simply asks if your Facilities Department regularly surveys its employees on their satisfaction.

| | Overall | Central | Rocky Mtn | Eastern | Southeast | Midwest | Pacific |
|---|---|---|---|---|---|---|---|
| Count | 81 | 12 | 8 | 21 | 17 | 17 | 6 |
| Yes | 64% | 50% | 75% | 57% | 71% | 76% | 50% |
| No | 36% | 50% | 25% | 43% | 29% | 24% | 50% |
| | Comp | Medical | Internat | Lib Arts | Research | Doctorate | 2 Year |
| Count | 19 | 4 | 3 | 7 | 28 | 10 | 10 |
| Yes | 68% | 75% | 67% | 43% | 61% | 75% | 60% |
| No | 32% | 25% | 33% | 57% | 39% | 25% | 40% |

### BENCHMARK PERSPECTIVE—Customer Satisfaction

**APPA 1996 PERFORMANCE STANDARD**

| | |
|---|---|
| Level 1 | No |
| Level 2 | Yes |
| Level 3 | Yes |
| Level 4 | Yes |
| Level 5 | Yes |

# Appendix B

# Survey Respondents

| Institution | Institution Characteristics | | |
|---|---|---|---|
| | Region | Carnegie | Funding |
| Alamo Community College District | Central | Two-Year | Public |
| Alma College | Midwest | Liberal Arts | Private |
| Anderson University | Midwest | Liberal Arts | Private |
| Appalachian State University | Southeastern | Comprehensive | Public |
| Atlantic Community College | Eastern | Two-Year | Public |
| Augusta State University | Southeastern | Comprehensive | Public |
| Auraria Higher Education Center | Rocky Mountain | Two-Year | Public |
| Brigham Young University | Rocky Mountain | Research | Private |
| California Polytechnic State University | Pacific Coast | Comprehensive | Public |
| Carnegie Mellon University | Eastern | Research | Private |
| Clarkson University | Eastern | Doctorate | Private |
| College of Medicine at Rockford | Midwest | Medical | Public |
| Colorado State University | Rocky Mountain | Research | Public |
| Columbia State University | Central | Liberal Arts | Private |
| Columbus State Community College | Midwest | Two-Year | Public |
| Duke University | Southeastern | Research | Private |
| East Carolina University | Southeastern | Comprehensive | Public |
| Furman University | Southeastern | Liberal Arts | Private |
| Georgetown University | Eastern | Research | Private |
| Georgia Southern University | Southeastern | Comprehensive | Public |
| Georgia State University | Southeastern | Doctorate | Public |

| Institution | Institution Characteristics | | |
|---|---|---|---|
| | Region | Carnegie | Funding |
| Glenville State College | Southeastern | Liberal Arts | Public |
| Golden Gate University | Pacific Coast | Comprehensive | Private |
| Greenfield Community College | Eastern | Two-Year | Public |
| Harford Community College | Eastern | Two-Year | Public |
| Harrisburg Area Community College | Eastern | Two-Year | Public |
| Haverford College | Eastern | Liberal Arts | Private |
| Hobart & William Smith Colleges | Eastern | Liberal Arts | Private |
| Indiana University at Bloomington | Midwest | Research | Public |
| Kansas State University | Central | Research | Public |
| Lakeland Community College | Midwest | Two-Year | Public |
| Lewis and Clark College | Pacific Coast | Liberal Arts | Private |
| Mansfield University | Eastern | Comprehensive | Public |
| Medical College of Ohio | Midwest | Medical | Public |
| Miami Dade Community College | Southeastern | Two-Year | Public |
| Miami University | Midwest | Doctorate | Public |
| Michigan State University | Midwest | Research | Public |
| Michigan Technological University | Midwest | Doctorate | Public |
| Middle Tennessee State University | Southeastern | Doctorate | Public |
| Mississippi State University | Southeastern | Research | Public |
| Montana State University at Bozeman | Rocky Mountain | Doctorate | Public |
| Moravian College | Eastern | Comprehensive | Private |
| Muskegon Community College | Midwest | Two-Year | Public |
| Northern Illinois University | Midwest | Doctorate | Public |
| Norwich University | Eastern | Comprehensive | Private |
| Ohio State University | Midwest | Research | Public |
| Oregon State University | Pacific Coast | Research | Public |
| Portland State University | Pacific Coast | Doctorate | Public |
| Radford University | Southeastern | Comprehensive | Public |
| Ricks College | Pacific Coast | Two-Year | Private |
| Rochester Institute of Technology | Eastern | Comprehensive | Private |
| Salt Lake Community College | Rocky Mountain | Two-Year | Public |
| South Dakota State University | Central | Comprehensive | Public |
| Southern Illinois University at Carbondale | Midwest | Research | Public |
| Southwest Texas State University | Central | Comprehensive | Public |
| State University of New York at Buffalo | Eastern | Research | Public |
| SUNY College at Brockport | Eastern | Comprehensive | Public |
| Temple College | Central | Two-Year | Public |
| Texas Tech University | Central | Research | Public |
| Towson University | Eastern | Comprehensive | Public |
| University of Alabama/Huntsville | Southeastern | Doctorate | Public |
| University of Alberta | Rocky Mountain | International | Public |
| University of Arkansas | Central | Research | Public |
| University of California, Davis | Pacific Coast | Research | Public |
| University of Central Florida | Southeastern | Doctorate | Public |
| University of Colorado at Boulder | Rocky Mountain | Research | Public |

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| Institution | Institution Characteristics | | |
|---|---|---|---|
| | Region | Carnegie | Funding |
| University of Colorado Health Science Center | Rocky Mountain | Medical | Public |
| University of Delaware | Eastern | Research | Public |
| University of Georgia | Southeastern | Research | Public |
| University of Idaho | Pacific Coast | Research | Public |
| University of Illinois at Springfield | Midwest | Comprehensive | Public |
| University of Illinois at Urbana-Champaign | Midwest | Research | Public |
| University of Maryland at Baltimore | Eastern | Comprehensive | Public |
| University of Massachusetts/Amherst | Eastern | Research | Public |
| University of Michigan | Midwest | Research | Public |
| University of Minnesota | Midwest | Comprehensive | Public |
| University of New Brunswick | Eastern | International | Public |
| University of North Carolina at Wilmington | Southeastern | Comprehensive | Public |
| University of North Texas | Central | Doctorate | Public |
| University of Northern Iowa | Midwest | Comprehensive | Public |
| University of Oklahoma Health Sciences Center | Central | Medical | Public |
| University of Richmond | Southeastern | Comprehensive | Private |
| University of Southern Maine | Eastern | Comprehensive | Public |
| University of Texas at Arlington | Central | Doctorate | Public |
| University of Texas at Austin | Central | Research | Public |
| University of Texas Medical Branch | Central | Medical | Public |
| University of Utah | Rocky Mountain | Research | Public |
| University of Vermont | Eastern | Research | Public |
| University of Virginia | Southeastern | Research | Public |
| University of Western Ontario | Eastern | International | Public |
| University of Wisconsin at Madison | Midwest | Research | Public |
| Villanova University | Eastern | Comprehensive | Private |
| Virginia Polytechnic Institute & State University | Southeastern | Research | Public |
| Wake Forest University | Southeastern | Doctorate | Private |
| Washington State University | Pacific Coast | Research | Public |
| Westmont College | Pacific Coast | Liberal Arts | Private |
| Wheaton College | Midwest | Liberal Arts | Private |
| Willamette University | Pacific Coast | Liberal Arts | Private |
| William Marsh Rice University | Central | Research | Private |
| Williams College | Eastern | Liberal Arts | Private |
| Worcester State College | Eastern | Comprehensive | Public |

## Appendix C

# SAM Survey, Original Metrics, and Definitions

SAM Task Force

The business of facilities management is complex and challenging. Very few individuals outside the facilities organization understand the diversity of the facilities management activities that are required to sustain a pleasant, effective, and conducive educational environment. And few inside the business have had the experience necessary to grasp the entire scope of activity required for effective operation.

APPA's new and evolving Strategic Assessment Model will provide a graphic illustration of the range and depth of the facilities activities involved, as well as a basis for developing a road map for improvement. The model is based upon a core set of benchmarks and a process for equalizing them for adaptation to any institution, regardless of size, funding source, or mission. We have three strategic goals for developing the Strategic Assessment Model:

1. On a global level, we can measure ourselves against others.
2. We can measure ourselves against ourselves and where we want to be.
3. We can enlighten others as to how to get there.

Using the balanced scorecard framework, the Strategic Assessment Model incorporates four key components that in turn support and advance the mission of the institution. The four key components of the model are Financial Perspectives, Internal Processes, Innovation and Learning, and Customer Satisfaction.

Following a beta survey using an initial set of SAM performance indicators, a consortium of innovative facilities professionals is in the process of further refining benchmarks, rewriting definitions, and adding or deleting items as appropriate. We will continue to collect data from as many institutions as possible to validate, revise, and improve the metrics and ratios developed for the model.

We invite you to contribute data and help us improve this model. Following is the original survey instrument and set of definitions for SAM.

# APPA Strategic Assessment Model Survey

**Please fill in the value for each separate benchmark indicator for your college or university. Use actual data from FY 1996.**

| FINANCIAL PERSPECTIVE | VALUE |
|---|---|
| Current Replacement Value (CRV) $ | $ |
| perating $ | $ |
| | $ |
| P ion $ | $ |
| Deferred Maintenance Backlog $ | $ |
| Deferred Maintenance Expenditure $ | |
| Gross Institutional Expenditure (GIE) $ | $ |
| Recharge for Services<br>Are your recharge rates fully loaded? (circle one) Yes No | |
| Comments or Additional Financial Perspective Benchmarks: | |

| INTERNAL PROCESSES | VALUE OR % |
|---|---|
| Strategy (circle one value) Integrated strategic planning and budgeting<br>Strategic plan supported by annual op. goals effectively<br>Strategic plan with mission & vision communicated<br>Strategic plan with mission & vision on the shelf<br>Mission statement in place | |
| Preventive/Predictive Maintenance Backlog in Hours | |
| Safety<br>(% work hours missed due to job-related injury or illness) | |
| Attendance<br>(% paid or unpaid sick leave taken) | |
| Total Energy Consumption (in BTUs) | |
| GSF served by BTUs listed above | |
| Comments or Additional Internal Process Benchmarks: | |

| INNOVATION & LEARNING | % |
|---|---|
| Training Investment % of Total Personnel Compensation | |
| Mandated Training as % of Total Hours Worked | |
| Continuous Quality Improvement (circle one value; see definitions for clarification of levels) Level 5<br>Level 4<br>Level 3<br>Level 2<br>Level 1 | |
| Comments or Additional Innovation & Learning Benchmarks: | |

| CUSTOMER SATISFACTION | % |
|---|---|
| % Services Measured Annually | |
| % Stakeholder Groups Measured Annually | |
| Do you regularly assess employee satisfaction and needs? (circle one) Yes No | |
| Comments or Additional Customer Satisfaction Benchmarks: | |

NAME: _____ INSTITUTION: _____





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## Strategic Assessment Model

### Instructions and Definitions

Developed by APPA: The Association of
Higher Education Facilities Officers

The **Strategic Assessment Model** survey requests data for each of the 18 core benchmarks identified by APPA's SAM Task Force. Simply fill in the value or percentage requested in the appropriate space. Please also include any comments, notes, or suggestions in the spaces provided.

Thank you for your assistance during our continuous testing and improvement of the benchmarks. We look forward to receiving your survey.

* * * * *

## Financial Perspective

### Current Replacement Value (CRV)

For the purpose of this survey, we are first defining Current Replacement Value (CRV). This numeric value can be derived by utilizing the following definition as a guideline. The first four financial benchmarks incorporate the Current Replacement Value (CRV) as the denominator.

**Current Replacement Value (CRV)** is defined as the estimated cost in current dollars to replace the institution's educational and general facilities (excluding auxiliary facilities). It should include the full replacement cost for all buildings, grounds, utility systems, and generating plants. It is suggested that the average total project cost per square foot, multiplied by the gross square footage of educational and general buildings be used for the building portion of Current Replacement Value (CRV). The costs to replace grounds, utilities, and generating plant should also be included to the extent they support general and educational facilities. This will likely require an apportionment of total replacement cost for these components that is consistent with the educational and general facilities they service and should exclude the auxiliary portion. ***NOTE:*** *Insurance replacement values or book values should* ***not*** *be used.*

### Annual Facility Operating Expenditures as a Percentage of Current Replacement Value (CRV)

**Annual Facility Operating Expenditures** includes all expenditures established to provide service and routine maintenance related to facilities and grounds used for educational and general purposes. It also includes expenditures for utilities (whether purchased or produced/generated locally), distribution systems, fire protection, infrastructure, roof maintenance, refuse disposal, structural systems maintenance, property insurance, and similar items. This category *does not* include expenditures made from institutional plant fund accounts, nor does it include expenditures for institutional support services such as mail, telecommunications, public safety, security, motor pool, parking, environmental health and safety, central receiving, etc.

Most institutions of higher education complete a financial statement through the Integrated Postsecondary Education Data System (IPEDS). The Annual Facility Expenditure figure may be found within the IPEDS report that you submitted to the National Center for Education Statistics. You can probably acquire this data from your institutional controller or budget officer.

### Annual Plant Renewal Expenditures as a Percent of Current Replacement Value (CRV)

**Annual Plant Renewal Expenditures** includes all expenditures required to keep the physical plant in reliable operating condition for its present use. These expenditures are over and above normal maintenance for items with a life cycle in excess of one year and are not normally contained in an annual operating budget (i.e., Annual Facility Operating Expenditures). This is a separately funded, uniquely identified program that renews, replaces, or renovates building systems on a schedule based on life cycle recommendations and on assessment of expected remaining useful life.

This is typically represented as a *portion* of the plant fund expenditures for an institution. Plant renewal focuses on maintaining the operability, suitability, and value of capital assets. It is accomplished through the replacement and rework of those components of a build-

ing that wear out even though those components are routinely maintained. Plant renewal is a time-driven process with specific useful life cycles for heating and ventilation systems, etc. This often is provided in the form of capital funding for "major maintenance" *before* it becomes "deferred."

The *total* Plant Fund Expenditures for educational and general buildings and grounds is contained within the Integrated Postsecondary Education Data Systems (IPEDS) report under Section 1, Part N, Line 05, Column (1) labeled as "Construction - Plant Funds."

### Annual Plant Adaptation Expenditures as a Percent of Current Replacement Value (CRV)

**Annual Plant Adaptation Expenditures** are expenditures required to meet the evolving physical needs of an institution and to meet compliance mandates. These expenditures are in addition to normal maintenance and are not usually contained within the operating budget. These are also typically represented as a *portion* of plant fund expenditures. Examples of Plant Adaptation Expenditures include such items as Americans with Disabilities Act (ADA) projects, asbestos removal, code compliance, and changes in classroom, research, and laboratory to accommodate current technology or programmatic needs. Adaptation is typically accomplished through renovation, alterations, and other improvements outside of the normal maintenance cycle.

### Deferred Maintenance Backlog (In Dollars) as a Percentage of Current Replacement Value (CRV)

The **Deferred Maintenance Backlog** consists of maintenance projects that were not included in the operating or plant renewal budgeting processes because of a perceived lower priority status than those funded with available resources. Deferred maintenance exists as a result of many years of inadequate Annual Facilities Operating Expenditures and Plant Renewal Expenditures. This data set is typically based on a facilities condition inventory or facilities audit, and

includes the entire dollar value of the institution's past-due Deferred Maintenance liability.

### Annual Deferred Maintenance Expenditures as a Percentage of Deferred Maintenance Backlog

Annual Deferred Maintenance Expenditures are defined as all actual expenditures during the fiscal year of the survey (including fiscal year-end partial payments) incurred on projects that are part of the institution's Deferred Maintenance Backlog. Typically, this is considered "catch-up" maintenance and is expended in the institution's plant fund expenditure category.

**NOTE:** There is an obvious need to apportion the institution's plant fund expenditures between the three categories of Plant Renewal, Plant Adaptation, and Deferred Maintenance.

### Annual Facility Operating Expenditures as a Percentage of Gross Institutional Expenditures (GIE)

**Gross Institutional Expenditures** is defined as the institution's total expenditures for educational and general purposes and excludes expenditures for all auxiliary functions.

This figure can typically be found in the Integrated Postsecondary Education Data Systems (IPEDS) report under Section 1, Part B, Line 12, Column (3) labeled as "Total Educational and General Expenditures and Transfers."

### Recharge for Services

**Recharge for Services** represents the support or indirect costs that enable a shop to deliver service to a customer. This question simply asks if your recharge rate is fully loaded. It is derived by taking the actual trade specific hourly labor rates and loading all identifiable support and indirect costs. This includes an apportionment of support costs for such items as administrative and supervisory activities. It also includes overhead costs such as non-productive/non-billable time of trades personnel (i.e., breaks, meetings, etc.), fringe benefits, vehicle purchases and operating costs, small tool purchases, uniform purchases and cleaning, training, etc.

## Internal Processes

**Strategy.** The degree to which leadership and planning are integrated and actively applied by the Facilities Organization in its support of the institution's mission and goals.

**Preventive/Predictive Maintenance Backlog.** The number of hours in backlog versus actual hours. The amount of preventive/predictive maintenance work reported in hours that has been identified and entered into the work control system to bring the facility to operating conditions per existing requirements. This indicator is normalized against the actual hours to perform preventive/predictive maintenance. Preventive maintenance is the periodic and planned maintenance actions taken to maintain a piece of equipment or system within its design operating conditions and extend its life. Predictive maintenance is the continuous or periodic monitoring and diagnosis of measurable physical parameters in order to identify component degradation so that (as needed) planned maintenance can be performed prior to equipment failure.

**Safety.** Percent of work hours missed from the job due to job-related injury or illness, as a comparison to total hours worked (including overtime).

**Attendance.** Any paid or unpaid sick leave taken as a percentage of total work hours worked; exclude vacation, holiday, and personal leave. This measure is a component or subset of Safety.

**Energy Consumption.** *All* institutional energy consumption, calculated in British thermal units (BTU).

**GSF for BTUs.** The gross square footage served by the BTUs listed in Energy Consumption above.

## Innovation And Learning

**Training Investment as Percent of Total Personnel Compensation in the Facilities Organization.** Total cost of training, with fringe benefits included. This includes all travel-related expenditures (such as meals, lodging, registration fees, etc.), the salary cost of the employee receiving the training while away from the job, and the salary and/or operational cost of in-house or campus-wide training personnel. Typical on-the-job training (i.e., apprentice-

ship programs) *would not* be included. However, time spent in specific or designated training activities (on-site vendor training, supervisory skills, new product or service orientation, professional conferences and seminars, regulatory compliance, etc.) *would* be included here.

**Total Hours of Mandated Training as a Percentage of Total Hours Worked.** State your total annual hours of training as mandated by local, state, or federal regulations (includes overtime hours in total hours worked). This measure is a component or subset of Training Investment as Percent of Total Personnel Compensation in the Facilities Organization.

**Continuous Quality Improvement.** This is a "sliding scale" to determine the extent to which the Facilities Department has implemented a total and continuous quality improvement process.

- *Level 5 (Stretch Goal)*--Complete implementation of a total and continuous quality improvement process with the facilities department as a part of a *university-wide* total quality process. This university-wide quality plan is also integrated with strategic planning. Activities are aligned with key strategies, and continuous improvement is linked to meaningful and measurable results across critical processes. The senior leadership of the university and the facilities department have clear agreement on important priorities and use of limited resources.
- *Level 4 (Best Practices)*--Complete implementation of a continuous quality improvement process *within* the facilities department has been accomplished. At this level, the department is not fully "linked" to a university-wide effort or completely integrated with university-wide strategic planning. Activities and efforts are not completely tied to the key strategies of the university. Although the CQI process is complete *within* the facilities department, the university does not have an overall quality plan integrated with strategic planning as required for Level 5.
- *Level 3*--At this level the facilities department is well on its way to institutionalizing a CQI process *within* the organization. Over 50 percent of the personnel in the department are involved and committed to a CQI process. All personnel have been trained

and efforts are well along to changing the work environment and culture of the organization.

- *Level 2*--The facilities department has recently started a department-wide effort to train and implement a CQI process. Senior level leadership within the department is committed to the quality principles, a vision and philosophy that will guide the department's quality efforts is "in place," a CQI strategy has been implemented, training has started, resources for implementation secured, and CQI standards and measures have been determined. All indications would conclude that the department is moving forward to institutionalizing the CQI process throughout the department and moving toward Level 3 and Level 4.
- *Level 1*--Some "informal" CQI processes may have been started, but an overall strategy has not been developed, "tested," and put into place. Management commitment is not complete. The following key management questions are still being resolved within the organization: Are you willing to change your organization? Will you create the environment for change? Will you train others and commit resources for that purpose? Will you demonstrate commitment by your actions? Will you positively reinforce progress? Most facilities departments (80 percent) are at this level.

## Customer Satisfaction

**Percent Customer Services for which Customer Satisfaction is Measured on an Annual Basis.** These services may include, for example, building heating, air conditioning, elevator, lighting, safety, accessibility, and general aesthetics; custodial services; grounds and landscaping; remodeling and alteration services; moving and setup services; mail services; and transportation or fleet services.

**Percent of Stakeholder Groups Measured Annually for Customer Satisfaction.** Stakeholder groups include trustees, the President, members of the administration, resource providers, faculty, students, parents, alumni, internal staff, and campus support groups, for example. Each facility needs to define its own group of stake-

holders; this metric evaluates what percent of those stakeholders are questioned at least annually regarding their satisfaction with the Facilities Department.

**Employee Satisfaction Measured.** Do you regularly assess employee satisfaction and needs?

Thank you for participating in the development of
*APPA's Strategic Assessment Model!*

## Appendix D

# The Formal Benchmarking Process

Mohammad H. Qayoumi

Benchmarking is not merely a set of numbers or the act of copying others. It is far more systematic than informal networking, gatherering anecdotal information, or learning from abstracts and articles. More importantly, benchmarking is neither easy nor quick and requires a significant amount of resources. Before an organization starts benchmarking, a number of steps are required as prerequisites. The process should begin with articulating the organization's vision, mission, and core values. This framework is used to develop the strategic plans and performance measures that define bottom-line accountabilities. A list of suggested tasks for developing a measurement process include the following major steps:

1. Identify what is important that needs to be measured. Look at the mission of the organization and identify your customers and what they value.
2. Determine the core activities and the critical tasks that are important to the customers to ensure their satisfaction. This may include defining the metrics, standards, and goals that must be met. The goals should be attainable, economical, and consistent with organizational objectives.

3. Translate these elements into data needs and determine how to collect the data and how often. It is important to define the data elements clearly and communicate that definition to everyone involved in data collection, verification, analysis, and interpretation.
4. Identify the individuals or entities that will need to collect the data. Determine the role of the organization, the utility, and any third parties.
5. Collect the data and devise ways the data could be validated. Make sure that data collected is free of statistical and personal bias and is collected based on the defined procedure.
6. Analyze the data and transform it into usable information. Some of the statistical techniques will be helpful in this area for data consolidation.

At this point, the organization should identify key performance measures that must be improved. These vital few areas can be potential candidates for benchmarking activities. It should be emphasized that not working through a procedure similar to that outlined above will result in a waste of valuable resources and is unlikely to yield the desired outcome.

### Benchmarking Methodology

A number of different benchmarking methodologies are found in the literature, ranging from a 4-step to 10-step process (for example, Alcoa uses a 6-step process, Xerox uses a 10-step process, and AT&T uses a 12-step process). However, the underlying structure of all of these processes is based on Walter Schewhart's Plan, Do, Study, and Act (PDSA) model. A typical four-step process includes the following steps:

1. Prepare to benchmark
2. Research processes
3. Document best practices
4. Report and implement best practices

A typical 10-step model is briefly discussed below.

#### *Step 1: Project Conception*

At this step, the organization determines what needs to be benchmarked and attempts to identify the scope, goals, stakeholders, and potential participants.

### Step 2: Planning

During this step, the organization finalizes team members, defines their roles, and formulates the plans for the project.

### Step 3: Preliminary Data Collection

This step involves identifying the criteria for the type of data that must be collected and the questions that must be asked concerning desired efficiency, cycle time, number of defects, and cost of operation. At this stage, data are collected using secondary research that primarily involves reviewing published articles in business journals, periodicals, and other recent publications. Other possible sources may include Malcolm Baldrige or state quality award winners, conference proceedings and presentations, and data from the major accounting firms and other management consultant firms.

### Step 4: Best-in-Class Selection

Using secondary research, at this stage a more detailed questionnaire is developed. The motivation is to use the questionnaire to limit the list to only a handful of relevant organizations that need to be studied more closely. The organizations that should receive a site visit will be determined at this stage.

### Step 5: Best-in-Class Data Collection

During this step, the organization schedules site visits to prospective partners, interviews their staff members, and gathers detailed information. The benchmarking Code of Conduct (printed at the end of this appendix) must be observed. The golden rule is not to ask your benchmarking partners questions that you are not willing to answer about your own operation. The discussion should also involve offers of reciprocity and sharing of general findings of the study.

### Step 6: Assessment of the Findings

After site visits are completed, the data gathered should be analyzed using performance measures, comparison matrices, and data normalization. The use of a measuring matrix chart is briefly discussed in the next section. The analysis will lead to gap identification and

enablers. Based on these findings, a set of final recommendations with goals and targets are developed.

#### *Step 7: Implementation Planning*

This step requires taking the goals and targets developed in the earlier section and developing specific operational plans for the new and modified processes. Benchmark findings should be communicated widely. Moreover, the findings should be translated into a set of core principles that will drive the action plans. When creating action plans, it is critical to be cognizant of organizational culture and how change can be introduced in a manner that will initiate the least amount of resistance. Clear identification and communication of tasks is crucial to the success of the project.

#### *Step 8: Implementation*

At this point, the project leader should monitor and control the progress of the implementation. The progress of the project should be communicated to all stakeholders, and any anticipated potential barriers should be identified. Building a commitment for the desired change as well as clear articulation and communication of targets and expectations are crucial for project success.

#### *Step 9: Celebration*

At the successful completion of the project, do not forget to celebrate team accomplishment. Moreover, team members should be recognized and rewarded for their efforts.

#### *Step 10: Recalibration*

After the completion of the implementation phase, it is time to measure the performance progress of the organization and begin secondary research to become aware of any new breakthroughs in the industry. Begin the process of identifying the next benchmarking project.

### Critical Success Factors for Benchmarking

Benchmarking is a nontrivial process that requires a sizable amount of resources. If done properly, its benefit can be enormous for an

organization. Conversely, when done poorly, the damages can be far greater than the wasted resources. Therefore, it is important to identify a number of critical success factors that can play a pivotal role in the success or failure of a project:

- Provide strong and visible leadership support of the project.
- Allocate adequate resources to the project.
- Do not proceed with preconceived views; be open to new ideas.
- Ensure the project is linked to organizational strategies.
- Use your best employees to serve on the team.
- Pay close attention to organizational culture and change management.
- Develop appropriate performance measures and a clear understanding of your own processes.
- Seek changes that are action oriented and that focus on process improvements.
- Develop an overall systematic plan for the project.
- Reward and recognize team members for their contributions.
- Celebrate your successes.

### Pitfalls of Benchmarking Studies

Most benchmarking studies take somewhere between nine months and one year. Sometimes, this time frame is not acceptable for processes where the pace of external change is more rapid. Without a carefully planned and well-executed project, benchmarking can continue for longer periods and cost much more than what was originally thought. Following are some of the common pitfalls that lead to delays and increased costs in benchmarking:

- There is a tendency to put the bulk of responsibility for benchmarking on better performers in the organization who are already spread too thin. It is a good idea to choose the best and brightest individuals, but these individuals' other responsibilities must be adjusted for the period of the study so that they will be able to devote at least 20 percent of their time on this effort.
- The team should include subject matter experts to review the material gathered from the literature search. Having an effective team facilitator is essential for the success of the team. The

team must collect performance data on the internal processes so institutional performance can be objectively compared with other institutions. This step is pivotal in determining appropriate candidates with which to partner.

- Defining the project scope should be one of the first tasks of the team. Many studies run into difficulty as a result of poor scope definition and clear focus. Studies can be wide and shallow or narrow and deep, but cannot be both wide and deep. Wide and shallow studies are helpful in formulating strategies and direction but cannot get into insights at the tactical level. Narrow and deep studies are needed when the emphasis is on operational and tactical issues to how see various specific tasks are completed and data are collected. It is essential to focus only on selected critical factors with the appropriate measures and not every item that may be deemed important.
- Finally, and most importantly, it must be clearly understood that identifying a benchmarking partner is the beginning of the difficult and critical tasks. Improving any process requires change, and managing change is the most challenging role of every leader.

### Potential Benchmarking Problems

To ensure that benchmarking efforts are not derailed, the organization must be aware of a number of areas.

#### *Inflated Performance Image*

Most organizations have a tendency to have an inflated image of their own performance compared with others. For instance, according to a self-rating study of small manufacturing firms (Wiarda & Luria, 1998), 81 percent of those surveyed believed their performance ranked in the top quartile, and 96 percent believed their performance was in the top half. It is safe to believe such perceptions are shared in many industries—and definitely among universities in general and facilities operations in particular.

This finding implies that when people are confronted with data from other organizations, an interesting and predictable dynamic emerges. In places where the performance of the organization is

higher than its competitors, those data are accepted without any question because they match the organization's beliefs. When the data show superior performance by other organizations, those data are looked at it with disbelief and the organization begins to question the source validity and integrity of the data. Therefore, preparing an organization for the fact that others may perform better than it is the biggest challenge of any benchmarking project.

### *The Need to Find a World-Class Partner*

The second area of caution is related to the quest of seeking the world-class performer with which to partner. It must be recognized that no organization can have superior performance in everything it does. It is more likely that the organization will find other companies that are superior performers in one or two of their processes but have average performance in other areas. That is why it is important to identify those few core processes that are important to the organization and seek partners who excel in those areas. Otherwise, the organization may waste time seeking that mythical organization that does not exist or may choose organizations that look good on the average but have mediocre performance on key areas in which the organization is interested.

Another potential pitfall when selecting a benchmarking partner is allowing general perceptions about a well-known organization get in the way of objectivity. For instance, a university famous for having an excellent engineering program may not have an effective deferred maintenance program, and a company that makes fast computers may not have a good employee reward program. One way of avoiding this pitfall is to disguise the actual names of organizations with a set of codes and have the team select potential partners based on actual performance.

### *Taking a Short-Term View*

Benchmarking involves a trade of information among two or more organizations. Negotiating this trade more than likely will require the involvement of senior leadership. This negotiation is in no way different than negotiating any partnership between two organizations. Development of any meaningful and long-term partnership

will be time consuming and will require genuine commitment from the leadership of both organizations.

#### *Viewing Benchmarking as a Stand-Alone Solution*

Finally, it is important keep in mind that benchmarking is merely another process improvement technique that can assist an organization in improving performance. Benchmarking should only be pursued when organizational shared vision, mission, and objectives are clearly articulated and the links to core processes are well defined.

Before jumping on the bandwagon and seeking benchmarking partners, an organization should begin with informal networking and migrate to systematically seeking best internal practices. This process will set the stage for external benchmarking.

Benchmarking partners should be examined only after this point; because arriving here implies that an institution has attained a level of organizational maturity for this ultimate benchmarking step. Remember, partnering requires a long-term commitment and expense on both sides, and no organization wants to partner with another unless the benefits outweigh the costs.

## To Probe Further in Benchmarking

The concept of benchmarking is intuitively obvious and simple to comprehend: "Learn from others who are doing something right rather than reinventing the wheel." In the literature available to date, benchmarking has been viewed as an empirical concept. However, the management discipline of TRIZ provides the theoretical framework.

In 1946 the Russian navy patent inspector Genrich Altschuller attempted to seek creative solutions for technical problems. After examining thousands of patents, he was able to develop underlying structural patterns of inventive process. He called this discipline TRIZ, which stands for Theory of Inventive Problem Solving, in Russian. TRIZ is the structured approach in creative thinking.

Altschuller concluded that although brainstorming techniques can lead to some breakthrough solutions, in the TRIZ process one

always looks for solutions only within one's own discipline and not outside. This phenomenon is called "psychological inertia," and it is the underlying reason why in many cases alternative technologies to articulate innovative solutions remain invisible and thus not explored. As a result of psychological inertia, the solutions proposed are not random cases from all possible solution space, but rather a highly stratified subset closely related to the personal knowledge of the individuals involved. In other words, in solving most complex problems, brainstorming techniques falls short of the necessary inventing rigor.

Altschuller categorized the thousands of patents he reviewed based on the problem-solving process used for each one. He realized that the same problems have often been solved over and over again in different disciplines, using one of only 40 fundamental principles. He also found that about 32 percent of solutions came from apparent solutions, 45 percent from minor improvements driven from the knowledge within the company, 18 percent from major improvements based on the knowledge from the industry, 4 percent from new concepts based on knowledge outside the industry, and only 1 percent as pure discovery. This finding implies that more than 90 percent of the technical problems have already been solved somewhere by someone.

Altschuller recognized very early in his research that solving most real engineering problems involved fundamental contradictions. As a result of this phenomenon, typical improvement solutions proposed are trade-offs among opposing parameters. Therefore, such a compromise solution means that the value of at least one of the parameters has deteriorated in the process.

TRIZ offers an opportunity to find breakthrough solutions that eliminate contradictions. More than 1.5 million patents have been analyzed thus far.

According to TRIZ there are common central tendencies in the evolution of many products and technologies; these tendencies are known as the Laws of Engineering System Evolution. Substance-Field Models can illustrate many problems. Thus, if there are a set of standard solutions for inventive problems, they can be applied to many other situations. Therefore, to solve a problem one must first

define the Substance-Field Model of the problem in terms of the Standard Substance-Field Model. One would then use the Standard Solutions for the Standard Substance-Field Model to solve the original problem. So, TRIZ in reality is benchmarking at the structural and abstract level beyond that on which current benchmarking practices concentrate. In addition, TRIZ demonstrates that brainstorming alone may not sufficient in developing optimal solutions. For more complex problems, breakthrough solutions require not only looking at benchmarking outside one's industry, but looking at more structurally sound techniques such as the one offered by TRIZ.

## Benchmarking Code of Conduct

**1.0 Principle of Legality**

1.1 If there is any potential question on the legality of an activity, consult with corporate counsel.

1.2 Avoid discussions or actions that could lead to or imply an interest in restraint of trade, market and/or customer allocation schemes, price fixing, dealing arrangements, bid rigging, or bribery. Don't discuss costs with competitors if costs are an element of pricing.

1.3 Refrain from the acquisition of trade secrets from another by any means that could be interpreted as improper, including the breach or inducement of a breach of any duty to maintain secrecy. Do not disclose or use any trade secret that may have been obtained through improper means or that was disclosed by another in violation of duty to maintain its secrecy or limit its use.

1.4 Do not, as a consultant or client, extend benchmarking study findings to another company without first ensuring that the data are appropriately blinded and anonymous so that the participants' identities are protected.

**2.0 Principle of Exchange**

2.1 Be willing to provide the same type and level of information that you request from your benchmarking partner to your benchmarking partner.

2.2 Communicate fully and early in the relationship to clarify expectations, avoid misunderstanding, and establish mutual interest in the benchmarking exchange.

2.3 Be honest and complete.

**3.0 Principle of Confidentiality**

3.1 Treat benchmarking interchange as confidential to the individuals and companies involved. Information must not be communicated outside the partnering organizations without the prior consent of the benchmarking partner who shared the information.

3.2 A company's participation in a study is confidential and should not be communicated externally without its prior permission.

**4.0 Principle of Use**

4.1 Use of information obtained through benchmarking only for purposes stated to the benchmarking partner.

4.2 The use or communication of a benchmarking partner's name with the data obtained or practices observed requires the prior permission of that partner.

4.3 Contact lists or other contact information provided by the International Benchmarking Clearinghouse in any form may not be used for purposes other than benchmarking and networking.

**5.0 Principle of Contact**

5.1 Respect the corporate culture of partner companies and work within mutually agreed procedures.

5.2 Use benchmarking contacts, designated by the partner company if that is their preferred procedure.

5.3 Obtain mutual agreement with the designated benchmarking contact on any hand-off of communication or responsibility to other parties.

5.4 Obtain an individual's permission before providing his or her name in response to a contact request.

5.5 Avoid communicating a contact's name in an open forum without the contact's prior permission.

**6.0 Principle of Preparation**

6.1 Demonstrate commitment to the efficiency and effectiveness of benchmarking by being prepared prior to making an initial benchmarking contact.

6.2 Make the most of your benchmarking partner's time by being fully prepared for each exchange.

6.3 Help your benchmarking partners prepare by providing them with a questionnaire and agenda prior to benchmarking visits.

**7.0 Principle of Completion**

7.1 Follow through with each commitment made to your benchmarking partner in a timely manner.

7.2 Complete each benchmarking study to the satisfaction of all benchmarking partners as mutually agreed.

**8.0 Principle of Understanding and Action**

8.1 Understand how your benchmarking partner would like to be treated.

8.2 Treat your benchmarking partner in the way that your benchmarking partner would want to be treated.

8.3 Understand how your benchmarking partner would like to have the information he or she provides handled and used, and handle and use it in that manner.

(Courtesy of American Productivity and Quality Center (APQC))

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*Published by*

**The Association of Higher Education Facilities Officers**
1643 Prince Street
Alexandria, Virginia 22314
http://www.appa.org

ISBN 1-890956-08-2